

# SUPPLEMENT.

# The Mining Journal, RAILWAY AND COMMERCIAL GAZETTE:

FORMING A COMPLETE RECORD OF THE PROCEEDINGS OF ALL PUBLIC COMPANIES.

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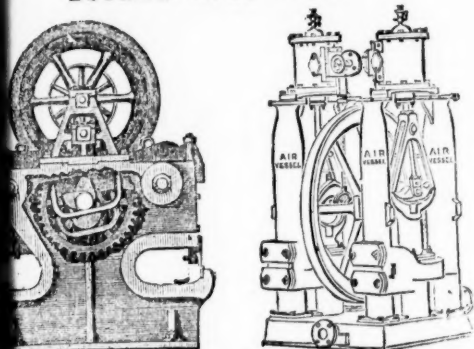
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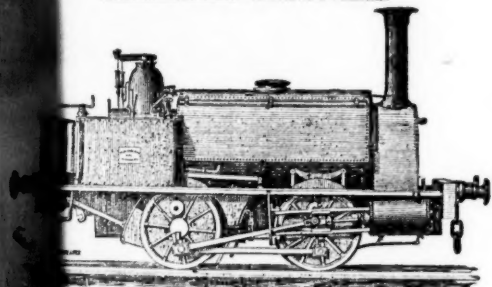
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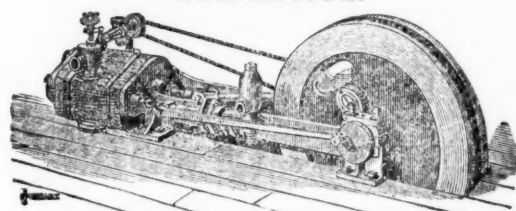
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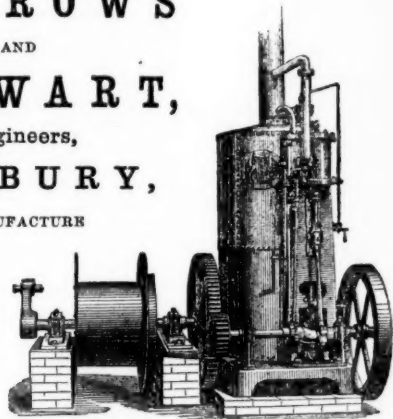
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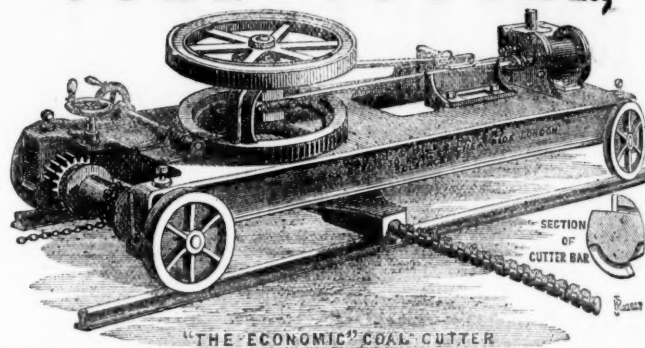
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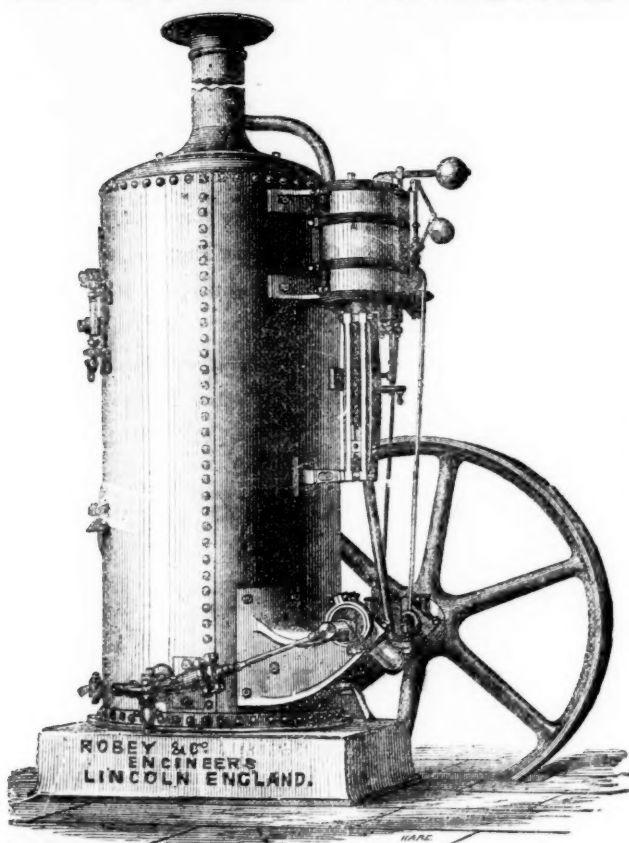


Patent No. 4136  
 Patent No. 4150

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Dated 16th December, 1873.  
 Dated 17th December, 1873.

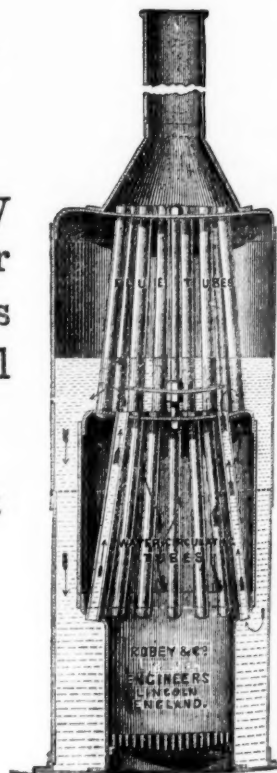
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# THE IRON INDUSTRIES OF SOUTH WALES.

## ANTHRACITE DISTRICTS.

By RICHARD MEADE, Assistant Keeper of Mining Records,  
Museum of Practical Geology.

In our previous notice attention was directed to the progress of the pig-iron manufacture in those districts of Glamorganshire in which bituminous coal was employed in the blast-furnace. In this notice it is proposed to trace the manufacture of pig-iron in those districts of Brecknockshire, Carmarthenshire, and Glamorganshire in which anthracite has been, and is now, used in its production, preceding with an account of the ironstone measures of the same districts, and returns of production, together with analyses of the ironstone, and concluding with some statistical details of the production of anthracite, charcoal, and bituminous pig-iron in the United States of America.

**IRONSTONE MEASURES.**—In the collection of British iron ores, made by the late Mr. Samuel Blackwell, of Dudley, in the year 1851, and in his report subsequently accompanying them, is found an interesting section showing the occurrence of ironstone measures in the anthracite or western district of the South Wales coal field. In this section occurs 17 measures in the neighbourhood of Ystalyfera and Yniseddlyn, of which the following are the more important:—In the uppermost part of the section at Ystalyfera we have a measure of blackband occurring 14 in. in thickness, and yielding an average of 2700 tons per acre. The "Black Pins" measure, next in descending order, consists of two courses, equal to 8 in. in thickness, and yielding about 2400 tons per acre. The "Soap Vein" next interposes; this measure consists of three courses, possessing a thickness varying from 9 to 10 in., and yielding about 2750 tons of ironstone per acre. A coal seam here occurs, known as the "Soft Vein," below which is an ironstone measure consisting of three courses, with scattered balls, yielding about 3600 tons per acre, and known locally as the "Penny Pieces," between which and the "White Pins" measure the Pentelin seam of coal occurs. The White Pins, sometimes called the Coedfald Mine, yields about 4800 tons per acre, and has a thickness of 16 in. occurring in a section of 14 ft. of ground, and consisting of four courses. Next we have the White Vein coal, a seam 18 in. thick, and resting on the "Black Vein Mine;" this last-named measure is made up of two courses, 8 in. in thickness, and yielding per acre about 2400 tons. The "Black Vein Coal," a seam 4 ft. thick, separates the "Black Vein Mine" from the "Little Vein Mine," which measure is regarded as the most important ironstone of the district of Ystalyfera, made up of ten courses in a section of ground of 18 ft., and is wrought with the Little Vein Coal upon which it rests, yielding of ironstone 7000 tons per acre. Two other measures here appear—the "Billets" and "Harrils Mine," the last-named resting on the Harrils Coal, and consisting of two courses. Below the Harrils Coal occurs the "Big Vein Mine," a measure of two courses, with a thickness of 6 in., and yielding when worked by level 1800 tons per acre. The "Big Vein" and "Black Vein" seams of coal next occur; the former 5 ft. 6 in. and the latter 2 ft. thick, and below the "Brass Vein" measure of ironstone, consisting of five courses, in 13 ft. of ground, and yielding an average of 3500 tons per acre, while below we have the "Brass Vein," the "Three Coal Vein," and the "Brynallen Vein," the first-named 4 ft. and the others 3 ft. thick respectively.

The known measures named at Yniseddlyn are the "Little Brass Mine," the "Cwm Fil Mine" (a measure of three courses), the "Little Blue Vein," the "Big Blue Vein," the Gnapog Mine, and the "Pin Mawr Mine," and it has been remarked that all the ironstone measures in this series bear the appearance of having been subjected to an extremely high temperature.

**ANALYSES OF THE IRONSTONE.**—In the Iron Ores of Great Britain, Part III., the measure known as the White Pins in the district of Ystalyfera, and sometimes called the Coedfald Mine, is thus referred to:—"This measure consists of balls and pins, or roundish nodules and flat courses; although called white, they are generally of a dark-grey colour, and have frequent cracks filled with carbonate of lime and iron, which in the iron fracture gives a vertical lenticular section." This ironstone measure, examined by Mr. A. Dick in Dr. Percy's laboratory in the Royal School of Mines, is found to be constituted as follows, the ore subjected to analyses being dried at a temperature of 100° C.:—

Results tabulated.	
Protoxide of iron	29.34
Protoxide of manganese	0.73
Alumina	0.95
Lime	0.84
Magnesia	5.53
Carbonic acid	24.66
Phosphoric acid	0.14
Sulphuric acid	Trace
Bisulphide of iron	0.08
Water	1.00
Organic matter	0.33
Insoluble residue	35.73=99.34

Insoluble residue.	
Silica	24.98
Alumina	9.75
Peroxide of iron	0.53
Magnesia	0.20
Potash	1.00=36.46
Iron, total amount	23.22

A trace of lead was detected in 910 grains of ore. Another argillaceous ore of the Ystalyfera district, known as the "Cheese Mine," is thus described; the sample from which an average was selected for analysis consisted of a nodule of clay-ironstone, dark-grey in colour, and intersected by numerous veins of calcareous iron-spar, in which a few crystals of quartz were discovered:—

Results tabulated.	
Protoxide of iron	42.72
Oxide of manganese	0.46
Lime	4.96
Magnesia	5.73
Carbonic acid	35.70
Phosphoric acid	0.49
Bisulphide of iron	Trace
Silica as quartz	0.26
Water hygroscopic	1.54
Water in combination	0.30
Organic matter	8.23=100.09
Clay, ignited	

The metallic iron contained in the above ore amounts to 33.45 per cent. From the foregoing and other analyses the average yield of metal from the argillaceous ore of the district may be taken as 33 per cent.

**PRODUCTION OF IRON ORE.**—The returns of the production of the district in which anthracite is employed being included in those of the South Wales area, it has not been practicable to separate them; in the years 1855 and 1856, when the production of this district was separately distinguished, it amounted to between 150,000 and 160,000 tons. It should, however, be stated that in the ironworks of this district by far the largest part of the ore employed is obtained from foreign sources, principally from Spain.

The following statement shows the yearly production of iron ore in South Wales, as far as returns have been received by the Keeper of Mining Records:—

Year.	Iron ore.	Year.	Iron ore.
1858	752,231	1870	561,095
1859	630,705	1871	939,714
1860	420,017	1872	1,247,594
1861	368,692	1873	945,928
1862	715,001	1874	661,616

The estimated value of the ore in the year 1872 was 1,247,594l.; in the year 1873, 945,928l., or about 12s. per ton; and in the year 1874, 661,616l., or nearly 10s. per ton, a falling off in the value of 1s. 6d. per ton when compared with the value in the previous year.

**PRODUCTION OF PIG-IRON.**—In previous notices of the iron industries of the South Wales coal area, it was found more convenient to deal separately with the iron-making centres of Monmouthshire and Glamorganshire, rather than considering the production of these districts collectively, they each possessing a history specially their own and dating from a remote period, while the anthracite district as a seat of iron manufacture is of recent date—since 1836, a period employed in the manufacture of pig-iron, to which by-and-by attention will be directed. The successful application of anthracite (which is practically regarded as a natural coke, and containing upwards of 90 per cent. of solid carbon) as a reducing agent in the

blast furnaces is associated with the names of Mr. J. Palmer Budd, of the Ystalyfera, and Mr. George Crane, of the Yniseddlyn ironworks, and dates about the year 1836; in the following year we learn that the first furnace was erected in the United States of America, at Mauch Chunk, in the Lehigh Valley, State of Pennsylvania, by a Mr. David Thomas, from South Wales, who commenced the manufacture of pig-iron, and where at the present time there are upwards of 40 blast-furnaces erected, while as many as 126 furnaces exist in the United States devoted to the manufacture of pig-iron with anthracite, of which it is recorded 83 were in blast in the year 1873, the production of anthracite pig-iron being 1,249,673 tons.

The anthracite furnaces of South Wales are of comparatively small volume and height, when compared with the furnaces of the Cleveland, Cumberland, Lancashire, and other iron-making districts in which bituminous coal previously coked is employed; this is due to the fact that the use of anthracite in high furnaces is attended with difficulty, owing to its decrepitation, which greatly impedes the smelting operation, this difficulty is only overcome by a dense powerful blast; of late years, however, there is a tendency to increase the height of those furnaces employing anthracite. The average height of the furnaces of the anthracite district may be taken as from 36 to 40 ft., the blast employed varying in pressure from 4 to 6 lbs. to the square inch, while the heated air of the blast ranges from 320° to 550° C. The earliest information showing the production of anthracite pig-iron is for the year 1839, it was then ascertained that out of a total of 26 furnaces 23 were in operation, making of anthracite pig-iron 65,780 tons, or an average of 2860 tons per furnace, while in the same year we learn that 11 new furnaces were in course of construction. The total production of pig-iron in the same year, 1839, in Great Britain amounted to 1,248,781 tons (of which 1600 tons were charcoal pig), the details of which will be found in the following statement:—

Iron districts.	Furnaces built.	in blast.	Pig-iron made.
Derbyshire	16	14	34,372
Durham and Northumberland	5	5	13,000
Gloucestershire	8	5	18,200
Lancashire (charcoal)	2	2	800
Shropshire	24	29	80,940
Staffordshire	10	3	15,200
Staffordshire, south	228	120	346,213
Wales, North	20	13	33,800
Wales, South	101	99	388,100
Wales (anthracite)	28	28	65,780
Yorkshire	29	24	52,416
Scotland	60	54	196,560
Scotland (charcoal)	2	2	800
Total	539	393	1,248,781

In the year 1848 the average production of pig-iron in the furnaces of this district amounted to 4680 tons per furnace. At this period there were nine works in operation employing anthracite, with an aggregate of 31 furnaces built, of which 14 were in blast. The following is a list of works and firms, with the furnaces built and in blast, in the several anthracite districts of South Wales, in the year 1848:—

Name of works.	Owners.	Furnaces built.	in blast.
Brecknockshire			
Yniseddlyn	Yniseddlyn Iron Co.	7	3
Carmarthenshire			
Gwendraeth	T. Watney and Co.	3	2
Trimsaran	E. H. Thomas	2	0
Bryn Amman	L. Llewellyn and Co.	2	2
Glamorganshire			
Baileys	Joint Stock Co.	2	0
Owllyn, or Brin	John Williams	2	2
Ynallt	Aberdare Iron Co.	2	0
Ystalyfera	Ystalyfera Iron Co.	11	5
Total		31	14

The estimated production of anthracite pig-iron about the year 1848 may be taken as between 60,000 and 65,000 tons. In subsequent years since 1855 the production has gradually diminished, as shown by the following abstract, the actual make in the year 1873 being 32,822 tons, and in the year 1874, 23,760 tons. For comparison, side by side, will be found in each of the same years the make of pig-iron in Great Britain:—

Years.	Anthracite districts.	Great Britain.
	Furnaces built.	Pig-iron.
1855	34	52,755
1856	36	63,440
1857	35	52,260
1858	31	22,914
1859	24	34,516
1860	23	27,909
1861	23	28,500
1862	19	34,761
1863	13	25,678
1864	13	32,822
1865	13	23,760

As previously stated, the furnaces erected in recent years in the anthracite districts show increased height and capacity; this will best be seen by an analyses of the returns given above for the year 1855, when 19 furnaces yielded 52,755 tons, or 2776 tons per furnace, while in the year 1873 the 8 furnaces then in operation produced 32,822 tons, giving an average yield per furnace of 4103 tons of pig-iron, showing an average increase yield per furnace of nearly 50 per cent. Referring to the year 1873 it will be desirable to note that the Ystalyfera and Yniseddlyn were the only companies engaged in the manufacture of anthracite pig-iron, the former having 6 and the latter 2 furnaces in blast during the year.

To render this section of the enquiry complete as regards the other iron-producing districts of the great South Wales coal field, in which bituminous coal is employed in the blast-furnaces, the following abstract will show the proportionate production of each district in Glamorganshire, Monmouthshire, and Brecknockshire in each of the same years as those in which the anthracite pig-iron returns are given—from 1855 to 1874:—

Years.	Glamorganshire.	Monmouthshire.	Brecknockshire.
	Pig-iron.	Pig-iron.	Pig-iron.
1855	757,315	399,649	70,779
1856	498,559	349,670	49,570
1857	517,525	349,387	35,790
1858	439,722	410,000	27,750
1859	458,188	392,387	32,301
1860	344,475	472,450	
1861	478,243	470,963	30,086
1862	610,067	485,678	28,500
1863	462,041	390,683	NZ
1864	330,484	360,480	NZ

\* Including the production of Monmouthshire.

† Including the production of Brecknockshire.

**COAL USED IN PIG-IRON MANUFACTURE.**—The characters by which anthracite may generally be distinguished are described as follows by Dr. Percy in his recent metallurgical volume on Fuel:—"It is very compact, deep black, both when massive and in powder, brittle, occasionally somewhat bronze like, or sub-metallic in lustre, bright, uneven, or conchoidal in fracture; it does not soil the fingers; it burns with a feebly luminous smokeless flame, and is much less easily combustible than other kinds of coal, and when heated it does not in the least degree sinter; some varieties decrepitate considerably, even when gradually heated." When converted into coke the small is selected, and in admixture with caking coals, pitch or coal tar in varying proportions is heated at a high temperature.

As previously stated, it was about the year 1836 that anthracite was first successfully employed in the furnaces of South Wales, in the production of pig-iron, by Mr. George Crane, of the Yniseddlyn, and Mr. J. Palmer Budd, of the Ystalyfera Ironworks. Anthracite, owing to its density and purity, yields pig-iron of good quality, and in order to overcome its decrepitation in the furnace, and secure satisfactory results, hot-blast at a high pressure must be employed. In the anthracite furnaces of South Wales a pressure of blast of from 4 to 6 lbs. is used, while in the furnaces of Pennsylvania, of larger capacity, from 6½ to 7½ lbs. of pressure to the square inch is employed. The average quantity of anthracite used in the manufacture of pig-iron is variously stated; some 20 years since it exceeded 50 cwt., but in recent years, as far as can be ascertained, it has varied from 4½ to 50 cwt. In one instance, at the Yniseddlyn Ironworks, we have it on the authority of Mr. S. Kenyon Rogers that his uncle, Mr. Blackwell, at the above-named works, made pig-iron with a consumption of 18 cwt. 2 qrs. 9 lbs. of anthracite per ton. As in all our computations of fuel consumed in the production of pig-iron, the quantity used for heating the blast boilers, &c., has been in-

cluded, we will add to the above 8 cwt. 3 qrs. 2 lbs. the amount required for the boilers, as determined by Mr. Blackwell in his experiments, and we have a total of 27 cwt. 2 qrs. 11 lbs. of anthracite per ton of pig-iron. This pig-iron, it should be stated, was particularly suitable for conversion into steel on account of the freedom of the anthracite from sulphur. An average sample of anthracite employed in smelting contains of sulphur 0.70 per cent., of ash 9.14 per cent., the ash consisting of silicate of alumina, a small quantity of lime, and a trace of peroxide of iron. Sulphur is always present in coal in combination with iron pyrites or bisulphide of iron, from which no coal is entirely free, and is either disseminated through the mass so as to be invisible, or occurring in laminae of a brass yellow colour, and sometimes in layers or nodules of considerable size. Considerable economy has of late years been secured by the collection and utilisation of the waste gases from the mouth of the blast-furnace. Previous to the solving of this problem by Mr. Budd, at the Ystalyfera Ironworks, it was estimated that nearly two-thirds of the total quantity of heat produced in the blast-furnace escaped, and was thus lost. It would appear that the first idea for utilising the heat of the gases and vapours escaping from the furnace head was to conduct this hot air through the hot-air stove, and use it instead of coal for heating the air which was to be blown into the furnace. In carrying out this arrangement Mr. Budd states that he constructed his stoves for heating the blast in such a manner that a portion of the hot gaseous escape from the top of the furnace was drawn through them, and thus economised. Previously the three stoves required to heat the blast at the Ystalyfera furnaces consumed 35 ton of coal a week, and required the attendance of two men. These gases, it should be stated, entered the stove at a temperature of 1800° Fahr., and leave it at about 800°, while the temperature required for the blast did not exceed 600°; thus it will be seen that the passage of the heated gases above, without any access of air, supplied more than the heat required, the gases, it must be remembered, escaping at such a temperature that if air was admitted to them they would at once burst into combustion, and thus form another source of heat which has been utilised in many of our ironworks in raising steam, and experience shows the higher the temperature of the blast employed in the furnace the less fuel will be required, while in every case the waste gases from the blast-furnaces would be found sufficient to heat the blast, and produce all the steam required for the blast-furnaces, and that in addition they might be used to calcine the native mineral.

Taking the actual returns for the year 1872, when 25,673 tons of pig-iron consumed 72,392 tons of fuel, we have an average consumption of 56 cwt. of coal to each ton of pig-iron made; this appears a high average, and probably includes coal used for all purposes other than that actually employed in the blast furnaces. The production of anthracite pig-iron in the year 1873 was 32,822 tons, consuming in its manufacture 81,837 tons of fuel, or an average of 50 cwt. of anthracite to each ton of pig-iron made. The returns for the year 1874 give 23,760 tons of pig-iron, the consumption of anthracite being 57,240 tons, or an average consumption of coal of 49 cwt. in each ton of pig-iron made.

**IRON ORE EMPLOYED IN THE MANUFACTURE OF PIG-IRON.**—Taking the year 1873, in the manufacture of 32,822 tons of pig-iron there was used of iron ore of all kinds nearly 77,000 tons, the great bulk of which was derived from Spain. The "native mine" used in the manufacture of the above-named quantity of pig-iron did not exceed 20,000 tons, yielding an average of metallic iron of about 33 or 34 per cent. The Spanish hematites yielding, as previously stated in our last notice, from 54 to 60 per cent. of metallic iron. Reducing the above-named quantity to an average, it is ascertained that 48 cwt. of ore of all kinds was employed in each ton of pig-iron made.

**LIMESTONE USED AS A FLUX.**—In this district the flux employed is a light-coloured crystalline limestone, consisting principally of carbonate of lime, of which a sample examined yielded 99.49 per cent., the other constituents being carbonate of iron, 0.18 per cent.; carbonate of magnesia, 0.07 per cent.; silica, 0.26 per cent., with traces of lime, alumina, and carbonaceous matter.

**PRODUCTION OF PIG-IRON IN THE UNITED STATES.**—In the year 1854 the total production of pig-iron amounted to 736,218 tons; of this 339,435 tons was anthracite pig, 342,298 tons charcoal pig, and 54,485 pig-iron, in which bituminous coal and coke were employed. Twenty years later, in 1873, the total production reached 2,695,434 tons, showing a nearly fourfold increase. The following statement for a few years will show the rapid development of the iron-making resources of the United States, distinguishing the quantities made with various kinds of fuel:—

Year.	Anthracite.	Charcoal.	Bituminous coal and coke.	Total.
1857	390,385	330,321	77,451	798,157
1858	519,211	278,331	122,228	919,770
1859	577,638	212,005	157,961	947,604
1860	749,387	248,396	157,961	1,155,744
1861	971,150	392,150	553,341	1,916,641
1862	930,000	365,000	570,000	1,865,000
1863	957,408	385,000	570,000	1,912,408
1864	1,369,812	500,587	569,871	2,440,270
1865	1,249,673	524,127	921,634	2,695,434
1874				2,695,434

The increased production in the year 1872 was due to the high prices ranging in that and the previous year, the demand for iron having far exceeded the average, and proved a great incentive to the ironmaster to augment his production; the financial crisis which followed, in 1873, brought about great commercial depression, and diminished production was the result. The immense repositories of iron ore and fuel abounding throughout the States will doubtless, with returning prosperity, be promptly utilised by the American ironmaster.

**PATENT FLAG SIGNAL FOR RAILWAY CARRIAGES.**—A working model of an improved method of communicating between the passengers, guards, and drivers of railway trains, was exhibited, on Friday, at the Royal Institution, Albemarle-street, by Mr. Charles Stewart, M.A., the inventor and patentee. The apparatus employed is enclosed in a small wooden box and placed inside the carriage against one of the top corners of the compartment. On a spring being released, by means of a cord which passes through each of the compartments of the carriage near the roof, a roller containing a red flag is projected through the side of the carriage, just beneath the eave of the roof, which flag unrolls itself by the action of gravity, and at the same time a rope in connection with the apparatus, running from end to end of the train, causes a bell to be rung in the guard's van, and the whistle of the engine to be sounded, whereby the attention of both the guard and engine-driver is called to the carriage from which the flag is displayed. The signal is equally available at night time, as the bright light from the interior of the carriage being reflected upon or seen through the red flag, renders the latter visible. After an alarm has been given the flag can be readily wound up again on its roller and returned to its original position by the guard or other person from the outside of the carriage, but cannot be re-set by anyone from within the carriage. This invention may certainly claim consideration, not only on the score of simplicity, but also on economical grounds, as it can be applied with the greatest facility to existing rolling-stock, and the cost of the apparatus need not exceed a two-hundredth part of the cost of the carriages themselves. Mr. Stewart's model was inspected with much interest by the distinguished persons present on the occasion, many of whom expressed their entire approval of his invention.

**PRECIOUS STONES.**—The theatre of the London Institution was densely crowded on Thursday evening to hear Mr. Ruskin deliver a lecture on minerals generally, but applying himself chiefly to the precious stones. The object of the lecturer at the commencement was obviously to give a comprehensive sketch of the mode in which Nature formed the more precious minerals, and the various purposes—symbolic, useful, and ornamental—to which when dug out of the earth they were put by man; but the pressure for admission was so great, and the consequent noise and interruption were so frequent, that Mr. Ruskin was obliged to turn over several pages of his lecture, and to proceed to the explanation of heraldic stones and colours, which formed its conclusion. Heraldry, he complained, was despised by modern science, but yet, as understood by our ancestors, it had a deep and important meaning. Or, or gold, which was represented by the topaz, stood between light and darkness; ecarlate was the sacred colour of the living flesh, as represented in the blush of the virgin and the flush of valour on the cheek of the young warrior. Vert was the green of the emerald, and gules was rose-coloured, from the Persian word "gul;" a rose azure was the clear, sacred blue of the sky, typical of the joys of Heaven. The ruby and sapphire were, in fact, the same stones, and in combination produced the purpura, or purple, which formed the covering of the tabernacle. Out of the above colours came the combination of the rainbow. Argent typified the silver colour of the hoar frost; and sable meant sand, in which the diamond was always found. Grey was the colour of the pearl, and suggested humility; and thus all the phases of heraldry which applied to colour and to precious stones, although now looked upon as jargon, had a deep symbolic meaning. Mr. Ruskin advised the ladies to have all their gems set en cabochon, and he cited the ruby in her Majesty's crown as the most beautiful specimen of an uncut precious stone in the world.



## Original Correspondence.

## DYNAMITE, AND THE RAILWAY COMPANIES.

SIR.—I see by the Supplement to last week's Journal that the attention of a "Practical Miner" has been directed to my letter of Feb. 5, which he says "contains some curious statements concerning dynamite," but I do not see that he has challenged any of them. I am not at all disposed to enter into a paper war over dynamite, cotton powder, or anything else, but I must say that a "Practical Miner," who I suppose is a manager, foreman, or perhaps an agent, having control over men, is not acquainted with the 14 rules; he ought to for the safety of the men under his charge, but he appears to be better up in that unintelligible volume, the "Report from the Select Committee on Explosive Substances." I think he might well find time to learn the rules mentioned, as I can assure him if he is a consumer of dynamite they will, perhaps, some day prove valuable to him. He appears to make some sort of fun of "some good cause." I would refer him to the Report on Explosive Substances, page 106, answer 114. I have no doubt that it is from the careful perusal of this report that they take their "good cause," as I have no doubt they would quite as willingly carry dynamite as anything else, providing they are satisfied with its safety.

FAIR.

## THE ROTARY BLOWER.

SIR.—Of the new things lately in the way of mining and metallurgical machinery the rotary blower stands among the more promising. It seems destined to supersede with great advantage the cylinder blower, where the fan fails to do so. In common with all who have had much to do with smelting, I have often felt the need of such a machine as, from notices appearing in the newspapers, this rotary blower seems to be. Would any among the numerous contributors to the Journal favour the metallurgical public by imparting to your columns such particulars as are necessary to form a correct idea of the real practical merits of this machine? Such particulars, for example, as (a), what pressure of blast is maintained; (b), whether the pressure is sufficiently uniform without a reservoir; (c), whether the machinery keeps long in repair; (d), what is the relative cost price of the rotary blower compared with the cylinder blower needed to do the same work, on the one hand, and a fan (say Lloyd's) on the other; (e), what are the relative merits of Baker's as compared with Root's blower?

The advertisement in the Journal of Dec. 4, while it gives a sufficiently full description of the parts and action of the Baker blower, leaves one in ignorance, however, as to the above indispensable data.

Inventors and makers of fans—as, indeed, of machinery generally—are notoriously apt to promise too much. How many advertisements has one not seen, for instance, of fans which the maker promises are capable of replacing in point of pressure many applications of the cylinder, but everybody who has had the trial of fans knows they fall lamentably short, and, indeed, are not applicable at all where the pressure needed exceeds a half-inch of mercury.

These rotary blowers aim at supplying a real want, and the principle of their construction bespeaks great likelihood of their success.

Orenburgh, Jan. 21.

T. RICKARD.

## MINING IN THE EAST—No. I.

SIR.—I observed in the Journal of Jan. 1 that an influential deputation had waited on the Grand Vizier in order to force on his notice the depressed state of mining in the Turkish provinces. They assured him that this was attributable to the restrictive and absurd jumble of regulations which up to the present has done duty as a *Code des Mines*. The most sanguine having long admitted the utter impossibility of mining successfully under the present régime, the deputation pressed upon the chief minister of the Sultan the desirability of arranging a code that would give capitalists facilities for procuring mining concessions, and assure them of the security of capital when invested in them. The Vizier is reported to have received them with great urbanity, and to have satisfied the deputation that he fully recognised the paramount importance of developing the mineral wealth lying hid in the European provinces which the effeminate descendants of Mahomet misrule.

The deputation appears to have been dismissed somewhat hurriedly, the Grand Vizier having probably his attention earnestly occupied by some petty palace intrigue, and, this being of greater consequence than any project for the improvement of industry, quietly relegated the subject of an improved mining code as to when another sanguine deputation may wait on him, when the same unsatisfactory amenities will be indulged in. Deputations on any subject connected with reforms in European Turkey may hope for success sometime after the Moslems have crossed the Bosphorus, and finally retired into Asia Minor.

Turkey is, I believe, to a large extent covered with secondary formations. I do not purpose for the present to enter into the question of the mineral riches of Roumelia and Bulgaria, though I may remark that from what I know I am not disposed to think very favourably of the mineral wealth which may exist in the Jurassic and Triassic rocks where disturbed by eruptive action.

I would take this opportunity to warn my countrymen against the folly of investing money in Turkish mines under the present system of administration. It really matters little whether the mines be rich or poor, as little, if any, profits will be permitted by the Pacha or his agents to accrue to the shareholders. It is rarely that a pacha leaves his pachalic other than rich; should he happen to do so he would be met with surprise and scorn by all classes, even by those he forbore to plunder. With regard to the possibility of reforms in Turkey, I may, perhaps, be permitted to refer to a conversation which took place not long ago on board a steamboat between Belgrad and Widin, which conclusively shows how confident the pachas themselves are that no reforms can be made. After a somewhat lengthy conversation as to the necessity for reforms, and the expressed wish of Sultan Mahmond that such reforms should be made, the Pacha of G— ended the interview by quietly remarking "that there was only one way in which the Sultan could hope to commence the reform, and that is by decapitating all the pachas."

The endless delays and expenses which the jumble used as a mining code causes is bitterly aggravated by the irritating careless and corrupt manner in which they are administered by the petty officers of the Government, who, being men but slightly educated and intensely bigoted, render the life of the resentful British miner a continual torment. Day by day comes some demand on the time or purse of the unfortunate resident agent, and, whether legal or otherwise—seldom legal, but very often otherwise—must be attended to. Bribery is resorted to with but small success, as impediments are placed in the way that require continual liquidation. I have often known petty—very petty—magistrates order the officers paid by a company to do something that would occupy the greatest part of a day to execute, and become excessively indignant when the resident agent has not permitted his officers to be so dictated to.

Unfortunately, before these local difficulties have been learnt much time and capital have been expended in obtaining the concession and preliminary charges, and so the company perseveres, hoping that matters may improve.

Those Turkish provinces really independent, but nominally under the suzerainty of the Sultan, present features more favourable to the speculator, the French mining code having been taken as the foundation. The Slaves, however, have by no means forgotten the manners of their former masters, and have well copied many of their vices. Although the laws do not permit bribery, one soon discovers that, like the wooden ungreased wheels of the Central American carreta, the friction is enormous, and results in just as much row. The emancipated Slaves object to any kind of manual labour, considering it derogatory to their newly-acquired semi-freedom, and when not possessed of sufficient means to start a little business prefer lying in idleness and dirt to performing any work.

There are fields of mining in the East in which capital judiciously invested would result in very fair profits; these I shall take a future opportunity of describing.

I propose in my next letter to give a general sketch of the geology of Serbia and its mineral deposits. These deposits have been in the

past very valuable, and were extensively worked both by the Romans and Venetians, as the remains of Roman baths and coins found in the debris abundantly attest. These deposits are really interesting from their peculiarity, and well merit the attention of the mining student.—Feb. 11.

EMPRESARIO.

## SWEDISH IRON ORE.

SIR.—I note the remarks of the "Writer of the Article," in last week's Journal. While Mr. David Forbes was the consulting engineer of the Central Swedish Iron Company (they called him Professor Forbes) they appear to have entertained the idea of sending ore to England. At the first general meeting of the company in London, on June 4, 1872, Major-General Sir Collingwood Dickson, K.C.B., in the chair, the report stated—"It is considered desirable to open out the mines held by the company, and should the present high prices of ore continue, to ship ores to England if on trial it should be found profitable;" and the Chairman said—"A trial shipment of about 1000 tons has been ordered, 200 tons of which are now coming forward," and I see in the balance-sheet for the period ending March 12, 1873, the ominous entry—"Loss on shipment of ore (trial cargo), 734, 10s."

I advise "Fair Play" to read the prospectus, dated London, Feb. 28, 1872, (Mr. Forbes's report is dated Nov. 27, 1871), with the reports and speeches of the Chairman, Mr. Forbes, and others, as reported in the papers at the time.

AN ENGINEER.

## RICHMOND MINING COMPANY.

SIR.—The directors of this company have always shown a great amount of virtuous indignation whenever it has been said that they have paid dividends out of borrowed money, and they have defended their policy by alleging that they have merely obtained advances upon the bullion produced; but now that they come forward to borrow 50,000, on debenture—not for working capital, but to repay in part, and in part only, the advances they have obtained from their bullion agent, and distributed to the shareholders in the shape of dividends—it appears to me they stand self-condemned, and that they must choose one of the horns of the dilemma upon which they have placed themselves—that of having paid dividends either out of borrowed money or out of capital. What would the Court of Chancery say to such financial manipulations?

OBSERVER.

Feb. 23.

## RICHMOND CONSOLIDATED MINING COMPANY.

SIR.—Months have passed since I put through your columns a series of questions concerning this unfortunate company. The then promised dividends have not been declared, the weekly returns have fallen off, the company (as was to be expected) has drifted into debt, and the shareholders are being appealed to for subscriptions towards debentures amounting to 50,000. My queries were put in reply to a communication appearing in the previous week's Journal, signed "One Behind the Scenes." The writer of that letter was clearly demonstrated by the matter communicated, but one of its most barefaced portions was the positive statement (the letter was published in the Journal of Oct. 30, 1875), "that a dividend would be declared next month," and that a well-known lead smelter, who has erected the new Roan pans at his works on the Tyne (the same as those now at work at the Richmond Mine), has purchased 600 Richmond shares. "One Behind the Scenes" at the same time also told us (October, 1875) that "the dividend next month will be on the six months' working, ending August 31, 1875, the gross profits will be 210,000." One would imagine this statement strong enough, but it pales away when "One Behind the Scenes" told us with unblushing effrontery "that the balance-sheet now in the hands of the accountants will work out so as to allow a dividend of 10s. per share, or 10 per cent. on the half-year." When this statement was made, "One Behind the Scenes" knew the company was heavily in debt to the bullion agent. We were further told that "Mr. Probert had been at San Francisco, but was then at Eureka," and added "One Behind the Scenes," "I have no doubt but that before he has been long there the Roan pans will do their work well, and our week's yield will rise from an average of \$12,000 to \$52,000, which means a 50 per cent. dividend."

The re-publication of "unanswered questions" seems fashionable just now, therefore with your sanction I will follow the fashion, and re-ask those I put in November, 1875. As I then wrote, your correspondent, "One Behind the Scenes," having an intimate knowledge of the company's affairs, may give some information upon the following points:—

1.—Who paid the "Rev." Mr. Probert's expenses to the Continent to find out the best process for the treatment of the Richmond ore? If paid by the Richmond Company, who is to benefit by an arrangement that may be made for the use of the patent in America, the right having been acquired by Mr. Probert?

2.—Why were 1000 to 1300 tons of bullion allowed to accumulate on the dumps, in order to make a good show for the patented process?

3.—Why, as the managing director of the Richmond Company, being in San Francisco during the whole of the financial crisis, knowing well from daily communication with the company's bankers, did not Mr. Probert keep his London colleagues advised of the impossibility of paying the dividend?

4.—Is it true that the Richmond directors have not had any official communication from Mr. Probert since some time before August?

5.—Is it true that this Roan patent has already cost the Richmond Company 18,000, or 60,000, in excess of Mr. Probert's estimate?

6.—If Mr. Reuben Rickard (the present manager of the Richmond Mine) was selected by Mr. Probert "as the best qualified man to work the Roan pans," how is it that, so far, the process has proved a disastrous failure, the company being again compelled to ship bullion, so as to reduce the heavy indebtedness to the agent?

7.—If the "best qualified man" has signally failed to make the patent work, what is the prospect that Mr. Probert may be able to do so upon his return from San Francisco?

8.—Upon what authority does "One Behind the Scenes" make the statement that "a dividend of 10s. per share will be declared next month?" If he really be "behind the scenes," most assuredly his clerical friend on the other side will admonish him severely for having made such a positive misstatement. Can the next dividend be declared before March next?

I must now alter the last query, and say it is doubtful whether any more dividends can be declared unless other discoveries are made.

ONE WHO KNOWS, BUT NOT "BEHIND THE SCENES."

Feb. 23.

## SEPARATION OF MINERALS.

SIR.—Will you be so kind as to allow me once again to make a few remarks in your valuable Journal in reply to Mr. Joseph Jewell? It is almost a pity that I should have hit him so hard that he threw himself into a "white heat" of passion, and using very "ungentlemanly" terms (to say the least of them), without disproving in his letter anything that I said. The reason of my delay in not answering him sooner was that I have other business to attend to besides writing letters. In the first place, I would remind him that I did not introduce the subject for discussion, but to defend Devonshire and Cornishmen from the onslaught made upon them by "Adventurer," who said that they could not separate lead from blende, &c. I told him, of course, that they had worse than that to do, and mentioned several mines where there was a combination of minerals.

Then, as to there not being any minerals of my dressing sold from Burrow and Butson, I would tell him that samples were taken and assayed, and a good marketable value reported of them, and I never knew but what they were sold, as I was given to understand they would be, according to the assays; but if they were kept for several months, and mixed with a lot of other stuff, as Mr. Jewell says, of course I cannot help that. And, as I have before stated, what I dressed so satisfied the managing director that he came for me some months after I left to return to the mine, and I have several letters in my possession in which he offered me double the amount of wages I before had received; and that fact says more in my favour than all Mr. Joseph Jewell can say against me. Mr. Joseph Jewell says he is not only a "theoretical book-taught" man, but has had many years "practical experience in many parts of the globe." Now, let me ask, Mr. Editor, what sort of a practical experience can he have

had in lead, for if am correctly informed it is only about five years ago he left a western mine to go abroad? He says himself he has visited many parts of the globe, and practised on minerals "too numerous to mention." And by the way, he boasts of his "merit," perhaps he will give your readers a satisfactory reason why (if reports are correct) the above mine, while he was agent, was making "calls," but in a very short time after other parties took it in hand it became a dividend concern, and no alteration in the lodes. He being but a young man comparatively, and he himself acknowledges a great portion of his time has been spent over the writing desk, his wanderings over so "many" parts of the globe in such a short time reminds one of Noah's dove, that could "find no rest for the sole of her foot."

In Mr. Joseph Jewell's first letter, it will be remembered, he said he "doubted if I could find one boy that could do it." Now he admits, there are very many employed about the same thing, but adds I "could not find one that could separate these minerals without instruction." No person said they could hence the reason why we prefer them young, for the express purpose of learning them. Such a remark as that just shows what sort of a man Mr. Joseph Jewell is, with all the instruction he has received from his scientific tutors. I hope your readers, Mr. Editor, will not misunderstand me here, as I certainly do not depreciate education, for it is a fine thing when made a proper use of, but when we see men of Mr. Jewell's stamp, vain of their great literary attainments, boasting of their extraordinary "amount of brain," and saying because they cannot do a certain thing it is not possible to be done (as he said in his first letter), I will leave the public to judge who the "conceited" party is. And our adventurers are getting to see that the men who write long flashy reports—great scholarly productions, written in such an elaborate manner that it takes a common man with an ordinary education some time, with a dictionary at his elbow, to understand what it means, are not the men, as a rule, who do the most work and bring them (the adventurers) the greatest interest for their money. Mr. Joseph Jewell intimates that in the present depressed state of things in the mining world the dressers are receiving too high wages; or, in other words, that mine managers are spending their employers' money needlessly. I will leave that to be answered by our Cornish and Devonshire really good, practical, thorough-going mine captains, of which the two counties can boast a large number, men of whom employers and employed have need to be proud; men, I maintain, who if they left their own country would be found wanting, and of whom we should not say that they "left their country for their country's good."

I should like to remind your readers, Mr. Editor, especially those who do not, perhaps, quite understand the meaning of the word "halvaner," that it is a person who can get a good living, and put money in the pockets of the adventurers, from a heap of stuff that some persons would throw away. I am exceedingly obliged to Mr. Jewell for his kindness in offering to "make a better man" of me, and to "set me on my legs," but, at the same time, I would say to him that I am there already, and so for the present decline his kind offer with "thanks." Certainly, it does not so much matter where a man is born, but I do contend that it does make all the difference where and what he spends the first 25 years of his life about. But, then, he says he "was born near the richest lead mine in Cornwall," but his western neighbours know that here his memory failed him, for West Chiverton is 11 or 12 miles from Redruth. It is evident that in a short time Mr. Jewell will have ample opportunity of displaying his skill in dressing, for, according to his own reports for some time past, his ends and stopes have been highly valued, but we earnestly hope he will not sell all his ores at one time, for he might possibly satiate the market, lower the prices, and thereby injure other companies.

Shall I be encroaching too much on your valuable space, Mr. Editor, to say a word or two in reply to your other correspondent, "Medio?" I would remind him that Mr. Jewell made the first "personal" attack, for I did not make use of any person's name in my first letter, but if the "cap" fitted him who is to blame? I would say to him that the minerals at Cargoll were thoroughly associated, and as in most mines a certain portion, of course, was picked, but by far the largest quantity was dressed. I should like for "Medio" to tell me whether or not he considers Mr. Joseph Jewell as coming out in the character of a "kind shepherd" in his first attack on me? Certainly I do respect "lettered gentlemen," and consider them my "superiors" when they act and speak like gentlemen in the true sense of the word.

THOS. ELLERY.

St. Teath, Feb. 17.

## MINING EDUCATION.

SIR.—Despite the enormous amount of capital invested by all classes in the search for minerals in this country, we possess no comprehensive treatise on mining—a *vade mecum* for miners. Were a student to enquire of a publisher for such a work that publisher must fain confess that he knows of no such book published in England, and that of those published in America he could not consistently recommend one. The want of some work on the concentration of minerals has also been much felt, the only notice I know of on this branch of mining being contained in Dr. Ure's Dictionary, edited by Mr. Robert Hunt, F.R.S. On metallurgy we have numbers of publications, and the mining engineer has usually little difficulty in obtaining information of the means for reducing his ores. It is, however, but seldom that managers of English mines have to smelt their own ores, the general practice being to sell all ores on the "floors," according to samples taken by the different smelting companies. Lately another branch of mining has attracted much attention, one which will demand careful study and great thought on the part of mining engineers. I allude to the chemical reduction of ores by what are generally known as wet processes, which are destined in the future to play no insignificant rôle. These processes are more particularly adapted to mixed ores of low percentage, of which immense quantities remain laid open in the abandoned mines of Cornwall; these ores are destined at no very remote date to be mined and reduced, and will give employment to hundreds in districts now made desolate by ruined mine buildings and decomposing attle.

The fact of there being no sufficient treatise on the subject of mineral deposits, and on the treatment of the ores therein contained, is a cause sometimes of grave inconvenience even to the experienced mine manager, and undoubtedly greatly retards the progress of the young miner, compelling him to rely principally on his actual experience gained in the localities where he has been employed. This tends to foster narrow and bigoted views, much to be deplored, and leading often to disastrous results. The young miner reasoning from the mineral formations, amongst which he has obtained his knowledge to other deposits geologically far removed, is peculiarly liable to glide into error, and be led to recommend the expenditure of capital in a wrong direction. The same remarks apply with perhaps stronger force to the means adopted for the concentration of minerals. As a young engineer, I felt seriously the want of works on mining, which I endeavoured to remedy by visiting various mining centres. Certainly during the past 20 years many publications have appeared which give valuable information of those sciences a knowledge of which is necessary to the manager of mines, still I consider that the most crying want of miners remains unsatisfied—i.e., a comprehensive work on mining containing geology as affecting mining, enough of palaeontology to distinguish the best known fossils, so as to determine the age of strata, occurrence of veins, and mineral deposits of every description, machinery used in mining, concentration of minerals, &c., in which should be added methods of reducing ores by wet processes.

Many books on mining and metallurgy have been published in America, but none supply the want felt. Most of them are evidently compilations from older authors brought up to the new modes used in America, while of those pretending to show *raison d'être* of mineral deposits most are meagre in detail, and fail to increase our knowledge, others being extremely wild, think cosmogony a part of mining, and treat us with an elaborate account of the formation of minerals during the time they suppose to exist between a difficult chaotic fire-mist, and the first consolidation of strata on the earth.

Few will be disposed to question that the want of sufficient data



That a very large quantity of gold was confidently expected at one time was evidenced, it was said, by the erection of a travelling crane at the reduction works for the removal of the melting pots containing the precious metals. I do not think this was altogether a bardic flight of fancy, although I never saw the said contrivance.



I know of one very good reason why public disclosures of the gold extracted were not always made. It is this. Dolfrwynog was private property, and the Crown had no vested right in the minerals. There was, therefore, at the time thought to be no obligation to make to the Crown agent under oath or affirmation any returns of minerals whatever, and that the Crown had no right of entry upon lands of private individuals to search for "royal mines." This notion operated on the minds of some of the owners of the mine for the time being I know, and the idea is not entirely dissipated to this day. The consideration of this branch of the subject will follow in due course.

That a much larger quantity of gold became tangible than was announced I am quite certain, for I have seen more with my own eyes, in its natural state, during occasional visits to the scene of operations than I have seen publicly declared. Besides, I once saw a bucketful of quartz hauled up that was worth at least 350*l*. There was a liberal distribution of specimens to the bystanders, and I came in for a bit which I have now in my possession, worth a sovereign or more. I have been recently promised further details, which I shall give if I get them.—Feb. 23. T. A. READWIN.

(To be continued.)

#### MINING SHARES—RELIABLE DAILY QUOTATIONS.

SIR,—After having given up all speculation and investment in mines for many years, I have again purchased shares in a few mines recently with satisfactory results, but I find the same highly unsatisfactory state of things in one particular that has always existed still remains the same, and that is the urgent want of reliable daily quotations of all the shares being dealt in, whether such shares are admitted to Stock Exchange quotation or not, or whether they are temporary "pets" of cliques or not. As an illustration of quotations now given, I will select the Van Mine for Monday, Feb. 21, the *Times*, 39 to 41; *Standard and Daily News*, 40 to 41; *Morning Post*, 40 to 42; *Morning Advertiser*, 41 to 42. As an illustration of the difficulty of getting a quotation at all, I may mention a mine with excellent and improving prospects which is likely soon to do better—San Pedro (Chili)—although I searched all the papers on Tuesday and to-day, Feb. 22 and 23, not one even mentioned the name, although large business is taking place daily. I have induced several friends to buy mining shares recently, good shares, such as Van, Roman Gravel, San Pedro, Ladywell, &c., but already some are desirous to sell, simply because they find they hold shares subject to sudden changes of value, and have no means of easily knowing the daily prices accurately, and I am quite certain that were this difficulty removed a much larger range of investors would support this market. Can nothing be done? A SHAREHOLDER.

#### OLD TREBURGETT MINE.

SIR,—In reference to the unreasonable royalty of 1-10th through which this unfortunate mine is on the verge of ruin, I will quote the doings of Mr. Basset from last week's *Journal*:—"Mr. Basset has given another proof of his liberality by reducing Cook's Kitchen and Wheel Basset dues to 1-60th (mark the disparity). We commend the example to those lords—happily there are not many of them, nor, as a rule, is their interest large—who think that the present is a time to insist upon their 'pound of flesh,' and thus do their best to kill the goose that in more prosperous times lays such a store of golden eggs." SHAREHOLDER.

#### PARYS MOUNTAIN.

SIR,—There is an error in the last paragraph but two of my letter of last week in reference to the ochre pits. It should have been at each "cleaning out" instead of "annually." The next clean out, I understand, will yield about 1000*l*. The precipitate pits it appears yield more than I stated, the last quarter being close upon 750*l*. ARGTS.

#### SOUTH CONDURROW—THE EXEMPLAR OF TIN MINES.

SIR,—Those who know but disagree with Capt. William Teague's crotchets concerning the non-charging up of the mine-cost while all tin is credited to the day of meeting will have observed with satisfaction the course insisted upon by the Chairman of the South Condurrow. Here we find the largest shareholder saying that "if any attempt were made to declare a larger dividend than had been actually earned in the sixteen weeks embraced in the accounts he should resign his position as a member of the committee," and with equal firmness did he advocate the desirability of charging in the accounts submitted the cost-sheet due on the following Saturday. One shareholder took a different view, because "such a course was not adopted at Dolcoath," adding "that Dolcoath is not in a worse position than South Condurrow." "No," said the Chairman, "probably not so good."

How many columns have appeared in the *Mining Journal* upon this very subject, and how many shareholders (at least, when transformed into contributors), have had to complain of the pernicious system now generally adopted in all tin mines. Too much praise, therefore, cannot be bestowed upon Mr. Marshall, the Chairman of the South Condurrow Company, for having thus undauntedly set an example which all interested in the future of tin mines would do well to follow.—Feb. 23. STANNUM.

#### DUCHY GREAT CONSOLS.

SIR,—A correspondent in the *Mining Journal* of last week being desirous of obtaining information with regard to the development of this mine, I beg to forward you the following particulars of the workings from the formation of the present company, and at the same time I would avail myself of the opportunity of mentioning that any enquiries made at the offices of the company are at all times most willingly attended to and answered.

At the commencement of operations, in 1872, it was necessary that that two engine-shafts should be drained, timbered, and secured from the surface; old levels had also to be cleared and made safe, with various other work attending the opening up of former explorations. At the surface also a considerable amount of preparation was required, and for the accommodation of the miners, carpenters, smiths, and others, houses had to be built and others repaired. Two steam engines have been erected—one a 50-in. cylinder, for pumping, and the other for hauling, crushing, and capstaning. A steam capstan, powerful crusher, and drawing machine have also been placed in the most advantageous position to command the different shafts, with ropes, pulley-stands, &c., complete. To the pumping-engine 200 fathoms of flat or pumping rods, with bobs and other connections, have been attached, and heavy pitwork at South Maria has been fixed to the 80 fathom level. Pitwork has also been fixed in Latchley engine-shaft, and the water drained to bottom of the mine.

The operations underground include the sinking of a winze from the 60 to the 80 fms. levels; the 80 has been driven east therefrom 26 fms., and the 74 east 2 fms., and west 14 fms. The 70 has also been driven west of south Maria engine-shaft a distance of 65 fms., making the length of drivages between the two mines 105 fms., and a rise of about 9 fms. is now only required to open up a communication between Latchley and South Maria. A new shaft has also been sunk from surface to come down on the winze sunk in the bottom of the 60, making a total depth of 80 fms. from surface, and the operations in different other parts of the mines have resulted in the sale of copper ores realising 1417*l*, and arsenical mundic 600*l*, with an estimated quantity of the latter mineral now on the dressing-floors amounting to 250 tons. I would observe that the mines being situated immediately adjoining the Devon Great Consols, and the stratification being precisely similar to that found in connection with the great deposits of ore in the latter celebrated mines, it has always been considered by practical authorities to be a most encouraging tract of mineral property; and, apart from the reports specially obtained from men of undoubted experience in Cornwall and Devon, the directors have within the past 12 months made arrangements to have the mine carefully inspected and reported upon by a gentleman of authority and sound judgment, recommended from the School of Mines, whose opinion fully bears out the views entertained by those who had before inspected the property. Although it is not in the power of any company to command success, I think I may fairly state that in the present instance no effort has

been spared to deserve it; and, in conclusion, I have only to remark that independently of the particulars supplied to the shareholders from time to time, and the periodical reports in the *Mining Journal*, it will afford me pleasure at any time to give on application any further information that may be required with regard to the development and prospects of the mines. THE SECRETARY.

Great James street, Bedford-row, Feb. 22.

#### EAST VAN MINING COMPANY.

SIR,—In last week's *Journal* it was stated that the recent discovery of lead ore at this mine was celebrated by a dinner to the workmen, given by the directors and shareholders. This is not the fact. The dinner to the workmen was given at the sole expense of a large shareholder in fulfilment of an old promise. F. F. WILSON, Sec.

[The workmen, we believe, were indebted for their treat to Mr. Robert Oldrey, one of the directors of the company.]

#### BOG MINE.

SIR,—As a shareholder in this mine, and well acquainted with the locality, allow me to give a few reasons for its further working.—1. The ground in the Bog Mine is much easier than any other in the district, costing from 3*l*. to 6*l*. to drive levels, against 10*l*. to 18*l*. usually paid in Roman Gravel and Tankerville.—2. A fine deposit of lead has gone down in the bottom level west of shaft, and a very fair one east.—3. A good deposit of blende is laid open in the eastern part of the mine, which is sold at the highest price in the market—from 6*l*. to 7*l*. per ton. The depth of Bog has been objected to, but it is only about the same depth as Tankerville, and 60 fms. or 70 fms. shallower than Snailbeach. ADVENTURER.

#### PENNERLEY MINE.

SIR,—It is stated on good authority that the engine on the above mine is quite capable of pumping any extra water from the Bog Mine in case the latter should stop. But even if this is not the case the Bog is on ground so much lower than Pennerley that it would only flood the bottom levels (say) below the 100, which are of less importance than the upper ones. But the richest part of Pennerley—Potter's Pit—cannot be affected at all by the Bog water; it is worked by a shaft 300 fms. east of the old engine-shaft, and is not connected by any levels with the deeper workings to the west. SHAREHOLDER.

#### WHEAL GRENVILLE.

SIR,—Mr. T. B. Laws, like most persons who have some time or other come forward on public ground to point out the faults of others, is exceedingly sensitive when a little caustic is applied to his own. He could not find words strong enough in condemnation of the management of Carn Brea and Tincroft, but as soon as a mine under his own superintendence is the subject of comment he calls it "unmanly and unfair." He says Wheal Grenville came into his hands encumbered with difficulties, and does not hesitate to charge the old agents with having caused the machinery both at surface and underground to get into a deplorable state through sheer neglect. If all this be true, did not the encumbrance of debt and defective machinery exist under the old management, and how was it the former agents could with all these difficulties return more tin than the present parties? I suspect this charge about the machinery will be found as groundless as the numerous charges made by Mr. Lane when agitating for a reformed management. It seems extraordinary that Capt. Secombe, whose report the Chairman of the last meeting alluded to as "a very full and exhaustive one, so different from the sameness of ordinary reports," did not allude to the "deplorable state of the machinery." On the contrary, Capt. Secombe said, "the returns of tin might be increased by attention being given to breaking the best parts of the lode." Now, Capt. Secombe would not be likely to anticipate larger returns of tin, however productive the lode, if the machinery were in such a condition as Mr. Laws describes. It is, therefore, very palpable that the present London management is now beginning to see that none of Mr. Lane's promises as agitator are likely to be fulfilled, and they will, therefore, bring forward this excuse of the "deplorable state of the machinery" before the shareholders as the cause of the non-realisation of Mr. Lane's prophetic inspirations. Probably the shareholders will again act the part of the credulous as they did in regard to Mr. Lane's golden promises. Mr. Laws thinks that more time ought to have been allowed the new management before passing judgment upon it. Well, this shall be my last letter for some time to come, but he may rest assured that all his proceedings will be closely watched and commented upon in the future. I have no personal feeling in the matter, I write as Mr. Laws did in the matter of Carn Brea and Tincroft Mines, on public grounds, and in the interest of mine agents. I look upon the late changes at Wheal Grenville as a question affecting every person in the service of a mining company. Agents of integrity and great mining experience were summarily dismissed upon unsubstantiated charges made against their character. Assertions and promises were made and given that the result of the change would be an immediate improvement in the affairs of the company. So far these loud assurances have not been verified, and, Sir, any other persons have as much right, and a far more justifiable one, to make comments upon the matter as Mr. Laws has to pass censure upon mines where the financial arrangements do not accord with his own views.—Camborne, Feb. 22. F. L. A. T. RODDA.

#### WHEAL PEEVOR, AND ITS LATE MANAGEMENT.

[The following letters have been addressed to the Editor of the *West Briton*.]

SIR,—In the report of the meeting lately held on this mine, Capt. James made several statements respecting the mode of working, which are at variance with the generally received notions of other mine agents, and in which he stands alone, or almost so, in his opinions; and in the working of this mine has carried his theories into practice to an extent that is believed to be very prejudicial to the interests of the shareholders, and it may, therefore, be just as well to further ventilate the subject. It is well known that Capt. James has been in the habit of selling the greater portion of the tin-stone to bargain buyers, as they are truly called, and in defence of this mode of procedure he stated at the meeting that the company had made a profit of more than 6*l*. per ton on black tin beyond what they would have made had they stamped the tin themselves, and he went into a long array of figures to prove his assertion. The value of these figures may, perhaps, be best judged by a statement of facts.

The tinstone at Wheal Peavor is sold by ticket to a great many persons who own stamping-mills within 10 miles of the mine, and who carry the tinstuff to their stamping-mills at a considerable expense, and there stamp and render it marketable. It is but reasonable that persons who are so engaged, and have been so for many years, and understand tin dressing better than any other men in Cornwall, should expect to make some profit by their transactions—in fact, a fair remuneration for their time and risk, and capital employed.

When it also becomes known that some of the principal of these tin buyers are not able to obtain sufficient water-power to stamp their tinstuff, and that a large proportion of the tinstuff from Wheal Peavor is stamped by them by steam power, it would really seem to be common sense that the said tinstuff could be stamped and dressed on the mine quite as cheaply as it could be stamped and dressed by other people at a distance: the carriage also for 3 or 6 miles, as the case may be, being a loss sustained by the Wheal Peavor Company, as well as the profit made by the buyers of the tinstone.

By way of bolstering up a bad case, Capt. James also asserted that the *West Basset* and *East Pool* Companies were benefited by selling their tin in the stone. But when it is remembered that the *East Pool* Company have, until recently, stamped the whole of their tinstuff, and that the reason of their now selling tin in the stone is entirely in consequence of their having a greater quantity than they can stamp out, but that they have recently added 16 heads to their steam stamps, and have a further addition in contemplation, it is evident that the agents of that mine do not share the same views as Capt. James with respect to the selling of tin in the stone. *West Basset* also sold large quantities of tinstone from the same cause. But when we look at the very large outlay recently made by them to put up a second steam-stamp, amounting to many thousands of pounds, so as to be able to stamp the whole of their tinstone, it is evident that in this case also Capt. James must be seriously in error, or else the agents of that great mine cannot know their business.

At Wheal Peavor the burnt leavings have been carted from the burning house yard back to the temporary stamps attached to the whim-engine, and are there passed through the same stamps grate they have been through before; and one of the miners jokingly says that "some of the said burnt leavings have been through the stamps so many times that every grain knows by experience what particular hole in the grate he has to pass through, and makes his exit from the cover before the stamp head can possibly strike him." At all events, the absurdity of treating burnt leavings in such a manner as this is apparent to anyone who has any knowledge of tin dressing.

There was also one statement made at the meeting which may be fairly commented on. Capt. James said that the mine would never pay cost at the pre-

sent price of tin, apparently forgetting that four months since he stated at the account meeting that from that time forward the mine would pay cost. And what a fact that since that meeting a valuable discovery of tin, reputed worth 55*l*. per ton, has been made in the engine shaft. Some people might have good memories. Taking the results of the past as a guide, the statement of not being able to pay cost at the present price of tin may not be so far out of the way. But they have the mine been worked? The 36, containing a large value under the mark at 17*l*. per fathom, cost of driving 7*l*., and worked by two men only. The 48, driving 6*l*. per fathom, shaft through a productive lode nearly all the way, and no means provided for charging the tinstone except by a wheelbarrow—not an inch of tramroad in the mine, the miners throughout the mine being obliged to wheel their own tinstone, as well as to fill it into the kibble, and, consequently, being seriously hindered in opening levels, &c., everything tending to retard the operations; and the number of fathoms of ground laid open by levels not being more than one-third of what should have been; calls being made to cover the deficiencies in the returns, and the local shareholders very sick of the whole proceedings. No mine in Cornwall could pay costs if conducted as Wheal Peavor has been. Dolcoath would be a losing mine if they sold their tin in the stone; and even East Pool is only making their profits by having a large number of points in operation at the same time. The *West Basset* would be some reason for the remarks of Messrs. Pryor and Michell, "that the Wheal Peavor tin buyers was not worth the paper on which it was written." Those who know both Capt. Whitburn and his detractors will be best able to value such statements. A SHAREHOLDER.

#### WHEAL PEEVOR.

SIR,—In your Monday's edition you have quoted the remarks of Messrs. Pryor and Michell respecting the tin assaying of this mine—"That it was not worth the paper on which it was written," &c. Will you be good enough to insert the following reply? All the tin samples of this mine were assayed by Capt. Whitburn for a period of twelve months, who, I believe, is in this particular capacity second to no man in the county. When Capt. Whitburn was first appointed the purser and his friends were very pleased with him, and raised his salary accordingly. Unfortunately this feeling, like a sunbeam, did not last through the winter, for Capt. Whitburn has such a thing as a conscience, and a reputation for tin assaying which will live in the circle of his friends when Wheal Peavor shall only be remembered as so many shaft burrows. I have above stated that Capt. Whitburn assayed the samples for the stamps, and against the tinstone buyers, and the result is only a difference of about 7 cwt. of tin between the quantities sampled and sold for a period of twelve months. If Capt. Whitburn's assaying for the stamps was wrong there would be some reason for the remarks of Messrs. Pryor and Michell, "that the Wheal Peavor tin buyers was not worth the paper on which it was written." Those who know both Capt. Whitburn and his detractors will be best able to value such statements.

Now a few words respecting the new tin assayer. Ever since Capt. White's appointment he has been assaying the samples for the stamps, and the result, in 18 weeks, is about 24 cwt. of tin sampled more than has been sold for the same period, the same rules on the dressing-floors having been strictly carried out as when Capt. Whitburn assayed the samples? Now, does this show? That either the dresser has relaxed his duties, or that Capt. White is not careful enough in his assaying the samples. Without expressing my opinion upon this subject, I leave your readers to judge for themselves.

When I accepted the management of the mine I found a deficiency of 9 tons of tin. That has never been accounted for from that day to the present. This, added to the recent deficiency, will make between 10 and 11 tons of tin ore that will probably never be accounted for. Had the tinstuff which produced this quantity of tin ore been sold in the stone to the buyers this great loss would not have been shown. I find by experience that they buy every particular in tin that a good assayer can make of it. This is one reason for selling tin in the stone, and the second is equally important—that it costs about three times as much to stamp a ton of tin stuff at Wheal Peavor as it does in other mines. A good stamp will produce a ton of hard tinstuff with the consumption of 84 lbs. of good coals. At Wheal Peavor the average of 12 months is about 224 lbs. I have no objection to a good stamp being erected, provided the prospects of the mine will warrant the outlay; but I have very strong objections to a thing called a stamp being erected in the place of one.—Redruth, Feb. 22. A. T. JAMES.

#### WHEAL WREY, LUDCOTT, AND NORTH TRELAWNY.

SIR,—I had concluded, as well as most others who had been induced to take shares, that this concern had dragged out its weary existence, and had entirely collapsed, after the strenuous opposition which had been given to it by the local shareholders since the time of allotment, on account of its insufficiency of capital and other causes before alluded to, but we were somewhat surprised this week by receiving advice by circular intimating that a meeting of the directors (but how many is not stated) held at Mr. Endean's offices in London, and at 1*l*. per share was made "to discharge the existing liabilities of the company and winding-up the concern," but the number of shares is not mentioned on which the call (which is quite illegal) is said to be made, or what the liabilities are composed of. Surely this requires some satisfactory explanation. I am at a loss, as well as all the locals here, to know what this exorbitant call is intended for, supposing it is responded to, which is very doubtful, as it must amount to a considerable sum of money if the statement of the local directors is true in reply to a question asked by Mr. M. W. Bawden at Liskeard allotment meeting how many shares were applied for, but his assertion of 4000 shares must have been correct, and is now being verified. The actual legal (or doubtful if) recoverable expenses must be exceedingly limited, as no money has been spent on the mine, and, if I am rightly informed (promoter can say) not one of the leases has been executed or handed over to the company. The promoters and directors have been acting by virtue of license or tacit note, which is nearly expired. I would suggest to all those interested in this unfortunate affair, to protect against any call or demand that may have been made by the remaining directors upon the wide accounts have been thoroughly sifted and a correct statement produced, with a legitimate investigation of all expenditure duly audited, disclaiming all promoters' premium, directors' fees, and all other illegal and exorbitant charges and unnecessary expenses said to be incurred by them. A statement of accounts has now yet been presented to the shareholders. Probably if an application is made to the Vice-Chancellor to appoint a liquidator, one having no connection with the present officials of the company, who would make a fair adjustment of actual costs to be allowed, which would be very trivial, and could not possibly amount to 2*l*. 6*d*. per share for all preliminary expenses. I hope the local opposition committee will watch the proceedings, and if necessary, carry out the suggestions recommended by their solicitor—Mr. J. G. Chilcott, of Truro—which would probably place some of the instigators of this concern in a most unenviable position. VIOCA.

Liskeard, Feb. 23.

#### PENNERLEY MINE (LIMITED).

SIR,—With reference to the letter signed "Investor," in last week's *Journal*, permit me to say that your correspondent has by error stated the wheal at Pennerley is and is already worth 45*l*. per fathom, and that the mine is worth 50*l*. per fathom in fact worth by last report 50*l*. per fathom. Again, the mine has just sold 1200*l*. worth of ore, and in the 120 fms. level, at engine-shaft, the lode is gradually improving as the miners work eastwards, and is worth 1 ton per fathom already. With present prospects, and adjoining Tankerville ground also, Pennerley Mine ought to become one of the regular dividend properties of Shropshire, and as depth is attained no doubt rests in the minds of practical men that this must be the case. The drive of a 90 fms. level at Potter's Pit end must result in a large accession of wealth and increased returns. This important point is a very short distance off, and the fact of the heat at this part of the mine, below the 75 fms. level, speaks for itself that a large body of ore will be almost immediately struck, and Pennerley Mine will then be properly appreciated and fairly quoted on the Stock Exchange. SPECTATOR.

[For remainder of Original Correspondence, see to-day's *Journal*.]

HANGMAN BURROW—THE FOX HUNT.—This celebrated heap of stones was collected nobody knows when, although some knowing old people say it took place in the reign of King David, or Solomon, and to commemorate a great fight with the inhabitants of the parishes of Crowan and Camborne. It is an enormous heap of stones, and situate near the borders of Camborne and Crowan parishes. Some years ago Hangman Burrow was selected as a central spot for a grand fox hunt, and there assembled on the occasion a great number of horsemen and hundreds of footmen to witness the sport. On the top of the Burrow was, amongst the rest, little Jan Temby, Uncle Jan Jewill, Uncle Henry Taylor (father of Tommy), the dowser Jimmy Dow, Captain Ned, and how many more I don't recollect. Amongst the horsemen were doctors, managers, and captains of mines. After some delay the grand hunt began. It was a "bag fox," and when it was let out it was so frightened, seeing so many people it would not run. Peter, the huntsman, then rode up, and smacking his great whip, started him off, when little Jan Temby shouted "Look! look! roses, there's the fox; there's the fox from the little gurgley, but I don't think all run." "Lor!" said Uncle Henry, "how what the poor little thing is looking; he's ready to bust out crying." "Well," said Jimmy Dow, "if that's a fox I'm not a bit afraid he'll steal any of my fowls. Why a couple of my mabys would beat a dozen of 'un." When Peter found the fox would not run he drove it over the downs in every direction, and then, as little Jan said, "stopped 'un in a cunderd." The hounds were then laid on the scent, and away they went in full cry—hounds galloping in all directions, the people hallooing and screaming enough to frighten a hundred foxes, when one old hound knowing more than the rest stopped suddenly before the cunderd; the little fox was pulled out and put into the bag again, and thus ended the celebrated Hangman Burrow fox hunt. It being, however, a lovely day, and the view from the top of the Burrow most extensive and charming, numbers of people remained a long time discussing various subjects. When Capt. Ned got on the top of the Burrow he was greatly surprised, and exclaimed, "Dear G—d! a man can go where he mind to from here." "Is, sure," said little Jan Jewill, "for you can see ships going to St. Ives, the Mount, and up by the Lizard; you can see the two seas, and by all account on a clear day with a good glass you can see Scilly Islands." "Oh, by the way, I soul! 'tes a fine sight," said little Jan, "but for my own part I'd sooner look here," said Tommy, the dowser, "I agree with little Jan; sose, look here," said Tommy, the dowser, "I agree with little Jan; but I want to know how none of 'ee have found good bales in sight of where we stand? I want to know what overlook the Gwennap



still it seemed desirable, to enable an estimate to be formed of the quantity of barytes, that a new shaft should be sunk to prove the extension of the lode.



The shaft was commenced at the former proprietor's own cost, and it was not long before it sunk into the barytes, so that if any doubt existed before as to the extent of the deposit it seemed set at rest by the sinking of this shaft. In most mines a long period was taken up in developing the property, but here delay should be avoided because shafts were already sunk, levels driven, and machinery erected, and, as far as he could judge, he hoped to see dividends commencing from this year. The company possessed about two miles through which the lode ran, so there was room for half a dozen mines.

Mr. EASTON seconded the resolution for the adoption of the report and accounts, which was put to the meeting and carried.

Mr. BARTLETT, in answer to a shareholder, said there would be no great difficulty in obtaining a market for the barytes.

Mr. H. M. OMMANNY said he had examined the property thoroughly, and from all he had seen and heard he believed the company possessed a property which would be highly remunerative.

After some further unimportant discussion, the proceedings closed with a vote of thanks to the Chairman and directors.

#### SOUTH CARADON MINING COMPANY.

At a general meeting of shareholders, held at the mine, on Tuesday (Mr. RICHARD HAWK in the chair), the accounts for tenth, eleventh, and twelfth months showed a profit of 1139s. 5s. 2d. A dividend of 1024s. (2s. per share) was declared, and the balance of 2318s. 18s. 11d. carried to credit of next account. The following report was read:—

Feb. 22.—Since our last meeting we have driven the 170 fm. level cross-cut (referred to in my last report) a little further south of Rule's shaft, and intersected the main part of the lode, which, I am pleased to report, is productive, although not a rich course of ore, yet such as can be worked at a profit. In West Caradon part we have cut the cross course, and are now driving on it to intersect the western heave of the lode. I am pleased to say that the mine in its various parts is looking as well as it has for some considerable time past.—JOHN HOLMAN.

#### WEST MARIA AND FORTESCUE CONSOLS.

At a general meeting of adventurers, held at the purser's offices, Hope-street, Glasgow, on Feb. 18 (the Purser in the chair), the accounts and vouchers from Sept. 10 to Dec. 31, both inclusive, being five months' costs, showed a debit balance of 240l. 2s. 1d. The meeting having considered the requirements of the mine for the next four months, did not think it necessary to make a call. In regard to the suit, the committee submitted the award of the umpire, which was in favour of the company, and which the meeting considered satisfactory. The committee reported as to the boring machine that after careful examination and inspection they had come to the conclusion that McKean's was the best. Plans were laid before the meeting, and it was agreed that one should be bought, along with the requisite appliances, and the remit to the committee for this purpose was continued.

Capt. W. S. WILSON, the manager, in his report, says:—"We have not yet got the boring machine, but hope to have it on the mine soon, as it is very important that the shaft should be sunk with all speed to reach the junction of the north and south lodes, at which point we look for good discoveries of copper. This mine is only now 104 fms. deep. There are many points we consider to be of great importance, which we should have proved long ere this if we had had the means of doing so. The greater portion of the returns made during the past year has been from the stopes in the upper levels, which were suspended eight or nine years ago, owing to the low price of copper and muddle. The new calciner is nearly all fixed, and will be ready to work in a very short time. Owing to the large quantity of stuff we have now to burn in the kilns, we are building a large addition to our flues for the purpose of securing the arsenic as we increase the burning. We are pleased to say that our last sampling of copper ore was 220 tons, and that we have now several hundred tons of muddle ore on the floors ready for the kilns."

#### WEST WHEAL TOLGUS.

A two-monthly meeting of adventurers was held at the mine on Wednesday, Mr. R. TAYLOR presiding. The account was a most satisfactory one, showing on the debit side—to labour cost for the two months ending Jan. 7, 1646l. 9s. 5d.; merchants' bills, 1239l. 3s. 5d.; charged on account of 13th month, 150l.; making 3035l. 12s. 10d. On the credit side there was by copper ore sold, 558½ tons, 3853l. 0s. 1d.; less dues 140th, 96l. 6s. 6d.; total credits, 3756l. 3s. 7d. The balance in favour of the adventurers from the last account was 1692l. 5s. 8d., and on the past two months' working, 721l. 0s. 9d., making a total available balance in favour of the adventurers of 1813l. 14s. 8d. The account was unanimously agreed to, and it was determined to declare a dividend of 25s. per share. It was stated that the ore sold for the next two months had realised, after deducting the duty, the amount of 3542l. 5s. 3d. This, it was calculated, would leave the mine about 65½ per cent. profit. The agents had also sampled 228 tons of ore for another two months, and the repairs of Taylor's engine pitwork, which was referred to at the last account, had been satisfactorily completed, and had produced a very good effect on the engine.

Capt. TONKIN, referring to an item of 901l. in the labour costs, asked where that had gone?—The CHAIRMAN replied that it was absorbed by the London office expenses and the agent's salaries. Whilst speaking upon this he might say that there was an expression of opinion at the annual general meeting that the staff were not paid a sufficient remuneration. And the managers of the mine did not think they were paid enough, although they did not at present intend to ask for any more; but if, as they expected, they did get a good lode in the 132, then they might, probably, ask for an increase.

Capt. TONKIN stated that he had known the agents for a considerable time, and he agreed that they were not paid enough; but, as there was a question as to the 132 lode, they had better let the matter rest until the next quarter.

Capt. JAMES raised a little discussion by enquiring into the prices paid for old and new brass, being informed that they were 2d. per lb. for old and 1s. 3d. for new. Other enquiries were made as to the price of coal and materials sent into the mine, and these having been satisfactorily answered by Major HAYZ, the meeting terminated.

#### VAN RAILWAY.

A general meeting of shareholders was held at the offices, Austin-friars, on Tuesday.

Mr. A. R. BOUGHTON-KNIGHT, Vice-Chairman, presided. The report of the directors stated there has been expended on capital account 74l. 4s. 3d., making the amount indebted to revenue 1142l. 4s. The net revenue account shows a profit of 828l. 3s. 1d., or 14l. 7s. more than in the corresponding period of 1874; this amount, added to the balance of revenue account at Midsummer, makes 1807l. 1s. 9d. The directors propose to pay a dividend for the half-year at the rate of 4 per cent. per annum, which will absorb 400l., and leave a balance of 1407l. 1s. 9d. applicable to the redemption of the sum of 1142l. 4s. disbursed in excess of paid-up capital.

The CHAIRMAN moved the reception and adoption of the report and accounts. There were some hopes that the traffic of the line would be increased by the improving prospects of East Van; there were one or two questions in connection with East Van which would have to be considered and arranged when they held the Van meeting on the mine.

Mr. PAGE seconded the proposition, which was put and carried. The CHAIRMAN proposed that a dividend be declared at the rate of 4 per cent. per annum.—Mr. JULIUS ARLINGTON seconded the proposition, which was put, and carried unanimously.

A vote of thanks was passed to the Chairman and directors, which concluded the proceedings.

#### SOUTH CROFTY MINING COMPANY.

A three monthly meeting of adventurers was held at the mine on Monday.—Mr. RODD (the purser) presiding.

The accounts showed a loss on the three months' working of 299l. 3s. 11d., and the balance from the last quarter being 987l. 1s. 5d., showed a total balance of 1256l. 5s. 4d. against the adventurers.

The PURSER said the loss sustained during the past three months was in a great measure to be attributed to the fall in the price of tin and arsenic, and if it had not been for that fall the mine would have almost made a profit. He was sorry to meet the adventurers under circumstances of depression, there having that day been another fall of 2s. per ton. The reduction in the price of coal was, on the contrary, very satisfactory, having decreased from 5s. to 17s., and the quality of the coal with which they were now being served was very good. The balance against the mine was rather a startling one, but they could not help it; the adventurers must blame the tin market and not the mine, which was doing its best in every way. Some of the adventurers were ready and desirous to pay off the adverse balance by one call, but his own opinion was that, for the present, a call of 10s. would be sufficient to meet the exigencies of the case.

The accounts were passed, and a call of 10s. per share made. Capt. THOMAS stated that this was the only call that had been made during the past twelve months, after all the bad times.

The PURSER stated that circumstances of a private nature connected with his family, which involved a trusteeship, rendered it impossible for him to continue the purser'ship of the mine, and he, therefore, resigned the office.

A vote of thanks was unanimously accorded to the purser for the satisfactory and efficient manner in which he had discharged his duties, and Mr. WHEAT then moved that Mr. Henry Lean, the accountant, be elected to the office of purser, at a salary of 10 guineas per month.—Mr. HARRIS seconded the motion, and it was agreed to with unanimity.

Mr. WHEAT asked what amount of dues they were now paying, and was informed by Capt. Thomas that it was 125th. It was generally agreed that, looking at the present depressed state of mining, this was a very heavy amount to pay, and it was determined to apply to the lords for a reduction of the dues.

Capt. THOMAS, in answer to a shareholder, said he could not state for certain that they had cut through the East Pool lode, although he believed that they had. It must be the lode, or some connection with it, as the stuff was so very good.

Mr. W. H. RULE drew attention to the present system of the supply of coal, and stated that he was the agent of a company who would undoubtedly deal with them much better and cheaper than they were now being supplied.

Mr. RULE said the supply of coal to any mine should not be confined to any one company, but should be thrown open, so that all merchants should have an opportunity of competing for a supply. The present system was one of monopoly, and had a most depressing effect upon mining.—Mr. LEAN stated that during the past quarter the mine had been supplied with coal from four different merchants.

The PURSER contended that so nothing was due to the Fortescue Company for the liberal and generous manner in which they had aided the mine. They were very much obliged to any persons interested in the coal supply for agitating the question so as to bring the price down, and he dare say Mr. Rule had succeeded in doing so (hear, hear), and he was very much obliged himself for such aid and assistance, but at the same time they should not on small and trivial mat-

ters quarrel with their friends.—Mr. RULE: If a man succeed in bringing down the price he should be patronised a little sometimes. (Hear, hear, and laughter.)

Mr. REED (Penzance) asked whether they could not get the mine supplied by contract?

Mr. RULE: I will engage to provide all the coal required for the mine, pump out the water, and pay the engine-men, at a saving of 20l. per month to the mine, and to do this I will enter into a contract for 12 months, and produce a guarantee for 1000l. for carrying out my contract. If it cannot be done one way it can be done another, and I am ready to sign a contract with the agents to do the work by 20l. a month less than it is now being done.

Capt. THOMAS said he could not average what his cost might be in the direction named during the next 12 months, so that he did not see his way clear to enter into a contract of the kind.—Mr. D. PEARSE pointed out that the serious point of consideration here was whether, supposing the price of coal fell to any extent during the year, Mr. Rule would reduce his contract accordingly?—Mr. RULE said he offered to take the contract in ignorance as to whether there would be a fall or rise in the price, and he considered that where an offer to effect a saving of 60l. a quarter was made, the adventurers would study their interests if they accepted it.

Mr. HARRIS agreed that it was a matter worthy of serious consideration, but desired that the matter should stand over for another quarter, when the agents probably would be in a better position to say whether or not they would accept such a contract.—Mr. REED suggested the desirability of advertising for a contract for six or twelve months.—Mr. RULE: I will take it for six months or three months.

Mr. REED: I think it is worthy the consideration of the adventurers.

Mr. RULE: There are friends of mine who have a heavy stake in collieries, and who would take up the supply of coal in this way. It is their object to send coal into this district, and if they cannot do so by the ton they will do it by contract by the month.—Capt. THOMAS said he would accept the offer in a moment if he thought it would be a saving, but as he could not see what would be the price of coal in the next six months he did not like to bind himself as desired.—Mr. RULE said his offer was open to be taken up, and he was ready at any time to enter into the contract, and give any reasonable security.—Western Daily Mercury.

'For remainder of Meetings see to-day's Journal.'

**MANGANESE AND IRON.**—We are informed that a recent examination by experts has revealed a much larger area of manganese ores in what may be termed the Wytheville district than we had suspected hitherto. Many forms of the valuable oxides of manganese exist here in quantities that would gladden the eyes of our steel-makers. Not the least attractive feature is the endless quantity of superior brown and red hematite iron ores, all within four or five miles of a railway that has through connections, with the seaboard in one direction, St. Louis, Memphis, and other cities in the other, now showing a decided disposition to foster mechanical industries, as well as other great industries of the country. A cooking coal is also within easy reach of the manganeseous belt, 17 or 18 miles away. It is a wonder to us that our furnacemen do not increase the capacity of their works, use manganese ores, and make a blast of strength sufficient to infuse at least 30 per cent. of the manganese into the pig, producing an article that would command a high price. Our cold-blast furnaces as they now work would not make a true spiegel, from the fact that the blast used cannot put more than from 5 to 8 per cent. of manganese into the metal, the rest of it not fusing sufficiently goes off in the slag.—Virginia Enterprise, Feb. 9.

**MINING ENTERPRISE IN AUSTRALIA.**—Nothing worthy of special notice has occurred in mining matters during the past month, excepting that the Hamley Company has paid its first dividend, the amount being 4000l. or 1l. per share. This company has been working for some years in the confident expectation of raising the mine to a dividend-paying position, and now that this point has been attained there is every prospect of dividends being regularly paid for many a year to come. Looking over the surface of the Moonta Mines recently, we could not avoid noticing the large quantity of dredge stuff, which to an uninitiated person looks so poor in ore as to be utterly worthless except as a road metal. At a few of the shafts may be seen piles of rich ore, but these constitute a small proportion only of the immense quantities of the low percentage orestuff which is hauled to the surface in the course of the ordinary operations of the mine. We suppose it was this circumstance—the fact that such a large proportion of the lodes yielded dredge ore—that first led the manager to devote his attention to the invention, and the subsequent perfection of machinery, specially adapted to make this large yield of almost dead material marketable at a comparatively small expense. From what we now daily witness it is almost impossible to calculate the beneficial results flowing from the successful achievement of his purpose. Various parts of the mine which had been abandoned as unprofitable have since the introduction of this machinery been worked by tributers at a profit to themselves and also to the company. Indeed, we have reason to believe that but for the introduction of this dredging machinery half the tribute pitches now on the mine would not have paid for working, and the importance of the invention may, in some degree, be estimated by that fact. This economy is further aided by the arrangements which permit the ore

stone to be conveyed direct from the shafts to the crushing mills, and thence as directly to the jigger: the whole process of dressing being reduced to the extremely low cost of about 5d. per ton. The magnitude of the operations and the numerous advantages may also be further estimated from the fact that during the 14 years of the existence of the mine it has returned nearly 1,000,000 sterling in dividends, besides continuously employing large numbers of miners and others, the present wages list showing the names of somewhere near 1800 persons. Surely if the mining enterprise in South Australia owes its prosperity to any one thing more than to other it is to this patent jigger for dressing low-class ore. Exceeding at the Burra, where a lode of fine peacock ore has just been opened at the 78 fm. level, no important discoveries in any of the mines have been recently reported, but as the work of exploration is carried on with unabated vigour, rich deposits are must eventually reward the adventurers for their enterprise.—York Press, Dec. 31.

**IMPROVEMENTS IN MOULDING.**—Some improvements have been made in apparatus for forming the moulds in which toothed wheels or other circular articles are to be moulded by Messrs. BILLINGTON and DARBYSHIRE, of Blackburn, the object of the invention being to dispense with the use of geared wheels as, owing to the play between the teeth, they cannot be relied upon to hold the moulding box in the exact position required relatively to the pattern. This is effected by adapting to the moulding table a perforated dividing ring, which is fixed above the periphery of the revolving table, and arranged to operate in conjunction with a locking device. The ring is made to answer the same purpose as the dividing plate on a wheel cutting machine, and to this end it is perforated with a series of sets of holes in parallel lines around its periphery. The table is held firmly in the required position by means of a screw, pin, or other locking device, the end of which engages with the holes in the dividing ring, and after each tooth of the wheel has been moulded the screw or pin may be withdrawn until the next hole in the dividing ring has been brought opposite to it by the turning of the table, to be again held in position during the moulding of the next tooth. Another part of the invention consists of improved arrangements for striking or smoothing the sand in a moulding machine preparatory to moulding the teeth, and also for forming the top and bottoms of moulds for such like circular articles. In connection with the striking apparatus a gauge or pointer is employed, made of metal instead of wood, as ordinarily employed, and capable of being adjusted by means of screws to any required diameter of mould. The inventors also claim the making of the segmental patterns used in moulding machines of smoother surface and more durable than heretofore, by coating them with a composition consisting of wood, naphtha, red lead, shellac, and painters' finish. The use of this coating renders available materials from which to make the patterns other than wood or metal, as ordinarily used, more especially certain kinds of cements, such as plaster of Paris, Portland, and Roman cement, which may be formed into patterns by the use of suitable moulds.

**SIGNALLING ON RAILWAYS.**—Experiments are, it is understood, about to be made with the improved automatic signalling apparatus invented by Mr. H. E. Skinner, of Kensington, some three years since, with the object of ensuring communication with the guard and driver of a train when, from any cause whatever, the ordinary semaphores and lights are invisible to them. The invention consists in placing inclined planes either outside or inside the rails and affixing to the engine a lever or pendulum, which is operated on passing over such inclined plane, thereby sounding the steam whistle and shutting off the steam. It is proposed to place the inclined planes under the control of the railway officials by means of wires and levers as at present, so that the inclined planes can be raised or lowered at discretion. When lowered the apparatus on the engine is not acted upon. The inclines can be placed at any distance from the signal-box or station to suit the circumstances of each particular case, and it is proposed also to use portable inclines to replace for signals. The development of the invention is looked forward to with much interest.

**ARTIFICIAL FUEL.**—According to the invention of Mr. J. A. HIR, of Amsterdam, artificial fuel blocks are prepared by compounding together turf or peat and small coal, or coal dust with coal tar and river deposit. The peat and coal dust are first ground into a fine paste which are then mixed with the other ingredients, and the compound is compressed in moulds.

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**HOLLOWAY'S OINTMENT AND PILLS.**—The present inclement season should teach us caution; exposure to its influence, combined with confined atmospheres, closed and heated rooms, frequently lays the foundation of evils which must be once attacked before serious mischief be brought about. We are all apt to be careless, and what at first sight may appear to be only a slight cold, may perhaps eventually terminate in some formidable malady. On the first appearance of anything of the kind this ointment should be applied (after due fomentation and according to the directions) to the chest and throat. This alone will afford great relief; but to doubly secure oneself, the pills should be simultaneously taken. This will confirm the cure.

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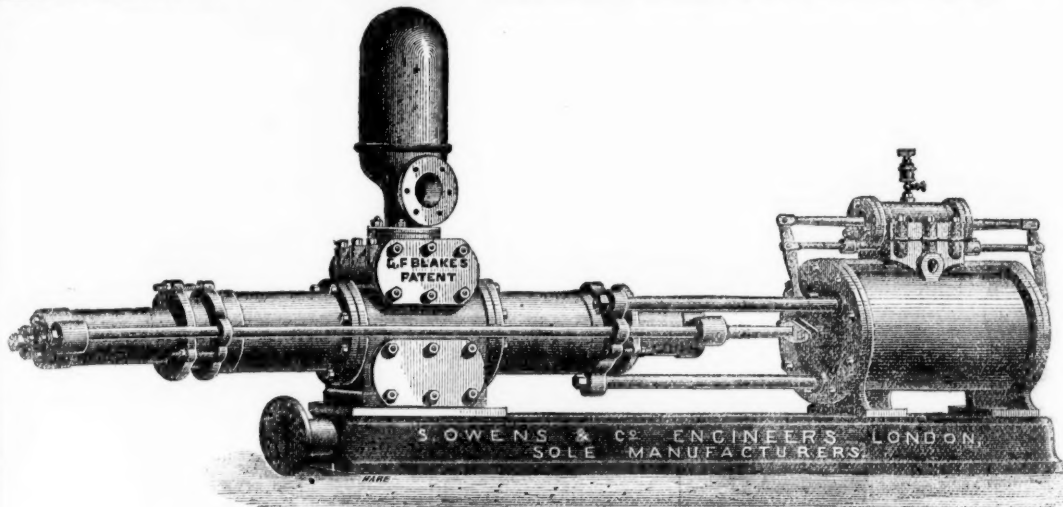
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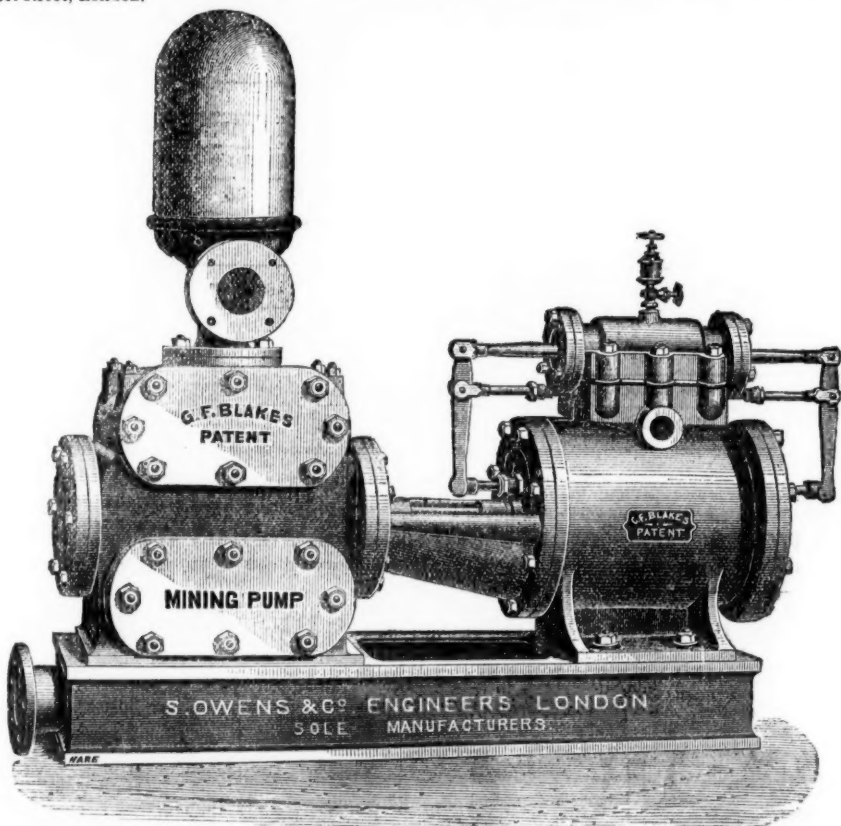
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Dia. of water cylinders. In.	18	18	18	24	24	24	24	24	24	24	24	24	30	30	30	30	36	36	36	42	42
Length of stroke. In.	30	30	30	30	25	25	25	22	22	22	22	22	22	22	22	20	20	17	17	17	15
No. of strokes per minute.	1440	2610	4200	5940	2940	4620	6600	2646	4158	5940	10620	2646	5160	7500	13260	4586	9000	12360	15660	6720	120
Quantity in gallons per hour, approximately ...																					

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VIENNA EXHIBITION, 1873.



LONDON EXHIBITION, 1874.



CORNWALL POLYTECHNIC SOCIETY, 1867 and 1873.

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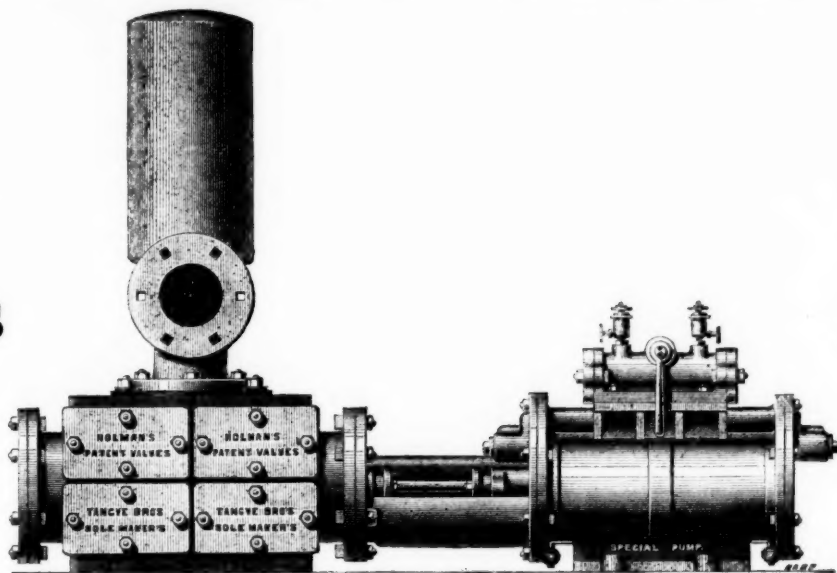
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Diameter of Steam Cylinder...In.	3	4	4	4	5	5	5	6	6	6	6	7	7	7	7	7	8	8	8	8	8	9	9	9	9	9	10	10
Diameter of Water Cylinder...In.	1½	2	3	4	3	4	5	3	4	5	6	3	4	5	6	7	4	5	6	7	8	5	6	7	8	9	5	6
Length of Stroke.....In.	9	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	18	12	12	12	18	24	12	12
Gallons per hour .....	680	815	1830	3250	1830	3250	5070	1830	3250	5070	7330	1830	3250	5070	7330	9750	3250	5070	7330	9750	13,000	5070	7330	9750	13,000	16,519	5070	7330
Price .....	£ 16	18	20	25	22 10	27 10	32 10	25	30	35	40	30	35	40	45	50	40	45	50	55	65	50	55	60	70	85	55	60

CONTINUED.

Diameter of Steam Cylinder..In.	10	10	10	10	12	12	12	12	12	12	14	14	14	14	14	14	16	16	16	16	16	16	16	18	18	18	18
Diameter of Water Cylinder..In.	7	8	9	10	6	7	8	9	10	12	7	8	9	10	12	14	8	9	10	12	14	9	10	12	14	12	14
Length of Stroke.....In.	12	18	24	24	18	18	18	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24	24
Gallons per hour .....	9750	13,000	16,519	20,000	7330	9750	13,000	16,519	20,000	30,000	9750	13,000	16,519	20,000	30,000	40,000	13,000	16,519	20,000	30,000	40,000	16,519	20,000	30,000	40,000	16,519	20,000
Price .....	£ 55	75	90	100	75	80	85	110	120	140	110	120	130	140	160	180	140	150	160	180	200	180	200	220	240	220	240

Intending purchasers of Steam Pumps would do well to observe the great length of stroke, short steam cylinder, and short piston of the "Special" Steam Pump, as compared with the short stroke, long steam cylinder, and long piston of the Pumps of other makers, as the efficiency and durability of the machine, and the space occupied by same, greatly depend upon this. The advantage of long strokes will be obvious when purchasers are reminded that each set of suction and delivery valves of a "Special" Steam Pump with 24 in. stroke, running at 120 ft. per minute, would open and close only 30 times per minute, as against 120 times per minute in a Pump with only 6 in. stroke performing same duty.

**The "Special" Steam Pump can be worked by Compressed Air as well as by Steam.**

HUNDREDS of these PUMPS are USED for HIGH LIFTS IN MINES, for which purpose they are made with 21, 24, 26, 28, 30, and 32-inch Steam Cylinders, and 36 48 and 72-inch Strokes.

## Holman's Patent Self-acting Exhaust Steam Condensers,

FOR ALL KINDS OF STEAM PUMPS AND HIGH-PRESSURE STEAM ENGINES.

Turns waste steam into  
GREAT POWER.

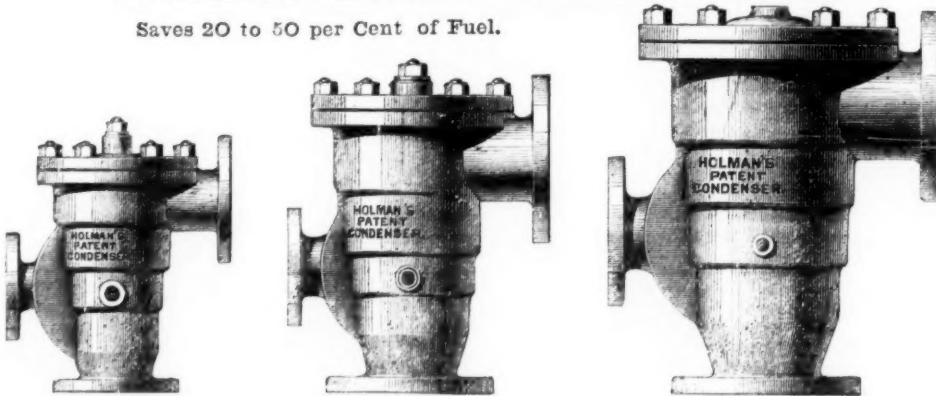
Requires NO THREE-WAY COCKS,  
CHECK, or REGULATING VALVES.

Saves HALF ITS COST IN PIPES AND  
CONNECTIONS.

Prevents ALL ESCAPE OF STEAM IN  
MINES OR ELSEWHERE.

Requires NO EXTRA SPACE.

Saves 20 to 50 per Cent of Fuel.



These Condensers are made to suit any size and kind of Steam Pump. They form a part of the suction pipe of the Pump, and while they effectually condense the exhaust steam, they produce an average vacuum of 10 lbs. per square inch on the steam piston, increasing the duty of the Engine, and effecting a saving in fuel of from 20 to 50 per cent.

In Mining operations these Condensers will be of great value.

All Boiler Feeders are recommended to be fitted with these Condensers, as not only the exhaust steam utilised in heating the feed water, but is returned with it into the boiler.

The following Testimonial gives one Example of the Power Gained by the action of Holman's Patent Condensers:—

MORLEY COLLIERY, WIGAN, October 16th, 1874.

Messrs. TANGYE BROTHERS AND HOLMAN.

GENTLEMEN,—I have great pleasure in recording my entire satisfaction with the working of the Holman's Patent Steam Pump Condenser which you have supplied to us. The complete condensation of the steam is, apart from its value in the strict economic sense, a most valuable feature in the drainage of underground work.

Price from 30s. to 40s. per inch diameter of Steam Cylinder, according to the relative Diameter of Pump for which Condenser is required.

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SOLE MAKERS IN GREAT BRITAIN.

HUNDREDS IN USE.

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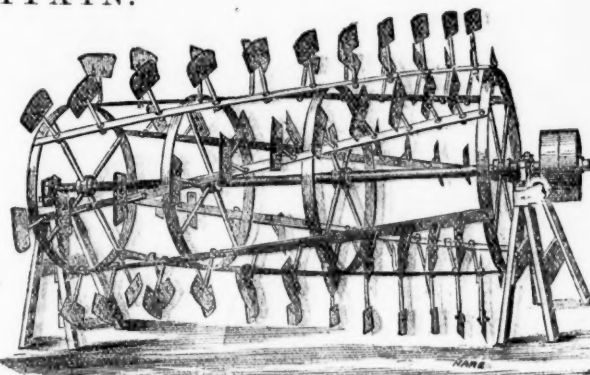
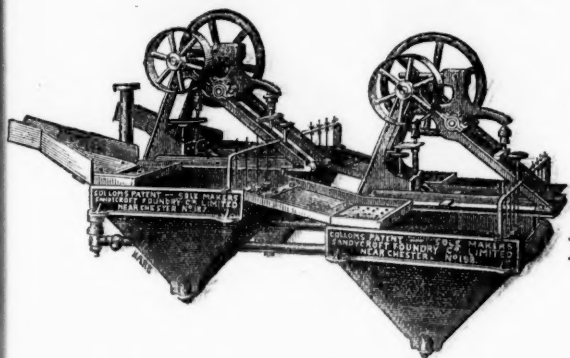
PUMPING & WINDING ENGINES,

PITWORK, CRUSHING MILLS,

ROLLS

OF PECULIARLY HARD AND TOUGH MIXTURE,

&c., &c.



COLLON'S PATENT AUTOMATIC ORE WASHING MACHINE, working at the following and many other Lead, Copper, Blende, and Tin Mines:—Great L. Key, Cape Copper, Pontgibaud, Linares, Alamillos, West Tolgus, Lisburne, Minera Halvana, Snailbeach, &c.; and also at Messrs. Vivian and Sons' Works, Swansea.

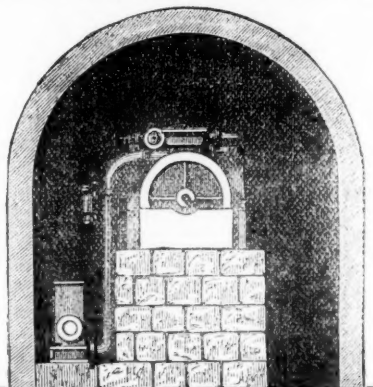
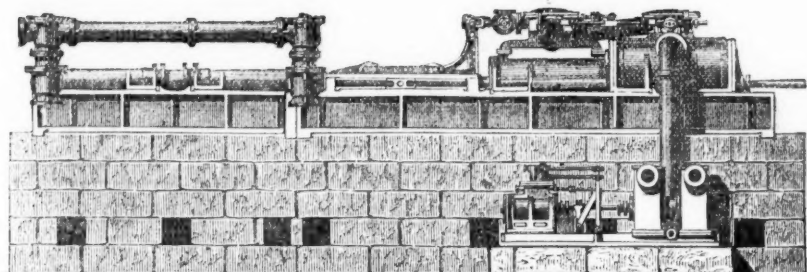
PATENT IMPELLER, OR KNIFE BUDDLE, in use at the following and many other Lead, Copper, Blende, and Tin Mines:—The Van, Roman Gravel, Tankerville, Ladywell, Lisburne, East Black Craig, Old Treburgett, Penhale & Barton, Bog, Linares, Fortuna, Alamillos, Minera Halvana &c.

LONDON OFFICE: 6, QUEEN STREET PLACE, E.C.

## HATHORN, DAVIS, CAMPBELL, AND DAVEY,

MAKERS OF

The Differential Pumping Engine, Hydraulic Pumping Engines, Cornish Engines, Differential Blowing Engines, Compound Rotative Engines, the Separate Condenser, Hydraulic Machinery, Mining Plant of all kinds, and Machinery for Water Supply, Irrigation, &c.



## THE COMPOUND DIFFERENTIAL ENGINE AND FORCE PUMPS,

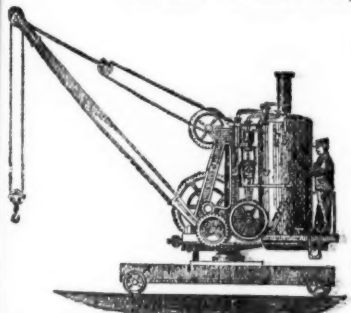
With Separate Condenser, as applied Underground, forcing 700 gallons per minute 920 feet high.

**SUN FOUNDRY, LEEDS.**

FURTHER PARTICULARS ON APPLICATION

## CHAPLIN'S PATENT STEAM ENGINES AND BOILERS,

PRIZE MEDAL, INTERNATIONAL EXHIBITION, 1862.



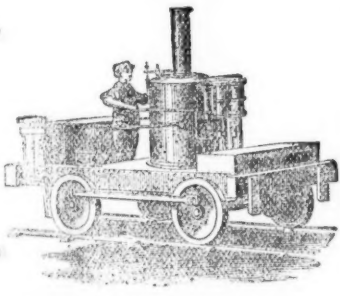
### STEAM CRANES,

Portable or Fixed, for Railways, Wharves, &c., for  
unloading  
COAL, BALLAST, &c.,  
To hoist 15 cwt. to 30 tons.

### LOCOMOTIVES,

6 to 27-horse power. For Steep Inclines and  
Sharp Curves.  
Gauge from 2 feet upwards.

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Pistons & Air-pump Buckets fitted with Patent Elastic Metallic Packing  
of which upwards of 8684 have been made to March, 1875.

**MATHER AND PLATT,**

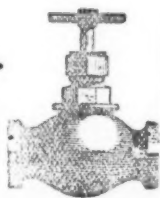
MAKERS OF LARGE PUMPS AND PUMPING ENGINES.

Improved Valves and Taps for Water, Steam, Gas, &c.

PATENT STEAM EARTH-BORING MACHINE  
ENGINEERS and MACHINE MAKERS to CALICO PRINTERS, BLEACHERS, DYERS, and  
FINISHERS.

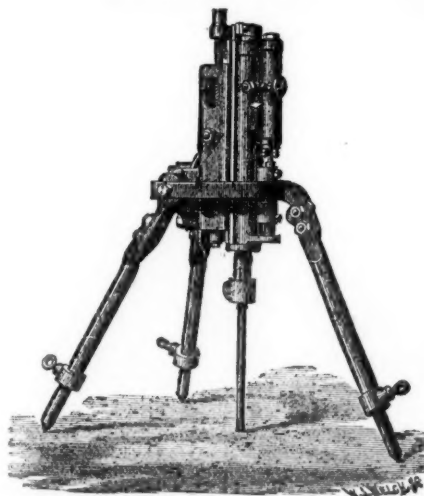
**SALFORD IRONWORKS, MANCHESTER.**

PRICES AND PARTICULARS ON APPLICATION.



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For Tunnels, Mines, Quarries,  
AND OTHER WORKS.



Intending purchasers can satisfy themselves that  
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For the amount of work it will do, it is the light-  
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**IMPROVED AIR COMPRESSORS,**  
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**ULLATHORNE & CO.,**

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## Ore Crushers, with H.R.M.'s New Patent Crushing Jaws,

EXTENSIVELY USED BY  
MINE OWNERS, &c.

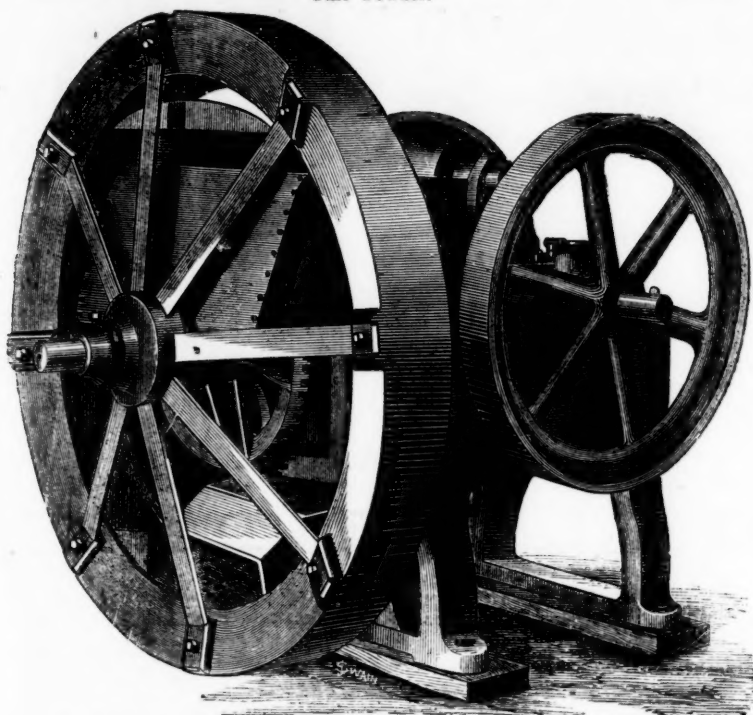
OVER 1150 NOW IN USE.

New Raff Wheel Machine, fitted with H.R.M.'s Special Jaws for Crushing Stone, &c. to Fine Powder.

## H.R. MARSDEN, LEEDS,

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FIFTY GOLD AND SILVER FIRST CLASS PRIZE MEDALS, including the R. A. S.'s SILVER MEDAL, have been received in competition with other Stone Breakers.

Machines fitted with H. R. M.'s renowned PATENT CUBING JAWS, by which stone is broken equal to hand at ONE-TENTH THE COST.

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SIMPLICITY OF CONSTRUCTION, &c.

THE ONLY ORE CRUSHERS WHICH COMBINE AND EMBRACE THE TRUE PRINCIPLES OF ACTION AND CONSTRUCTION FOR THE PURPOSE DESIGNED.

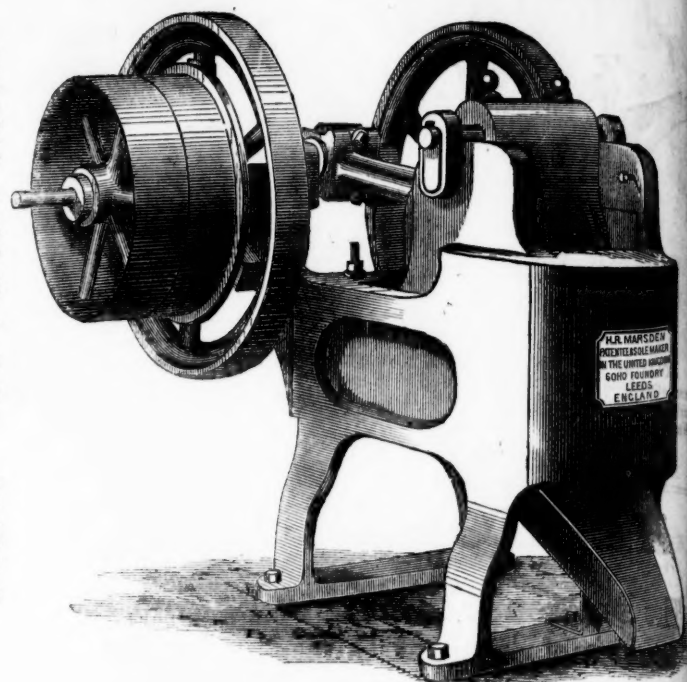
## Great Improvements in Mining Machinery by the use of

H. R. M.'s

## NEW RAFF-WHEEL MACHINE

WITH NEW PATENT CRUSHING JAWS,

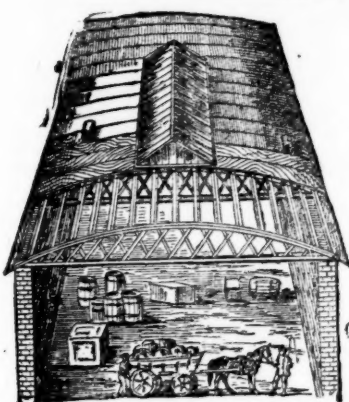
BY WHICH ORES OF EVERY DESCRIPTION CAN BE REDUCED TO FINE POWDER.



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FOR  
GREAT ECONOMY  
AND  
CLEAR WIDE SPACE.

For particulars, estimates,  
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OR  
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The above drawing shows the construction of this cheap and handsome roof, now much used for covering factories, stores, sheds, farm buildings, &c., the principal of which are double bow and string girders of best pine timber, sheathed with 1/2 in. boards, supported on the girders by purlins running longitudinally, the whole being covered with patent waterproof roofing felt. These roofs so combine lightness with strength that they can be constructed up to 100 ft. span without centre supports, thus not only affording a clear wide space, but effecting a great saving both in the cost of roof and uprights.

They can be made with or without top-lights, ventilators, &c. Felt roofs of any description executed in accordance with plans. Prices for plain roofs from 30s. to 60s. per square, according to span, size, and situation.

Manufacturers of PATENT FELTED SHEATHING, for covering ships' bottoms under copper or zinc.

INODOROUS FELT for lining damp walls and under floor cloths.

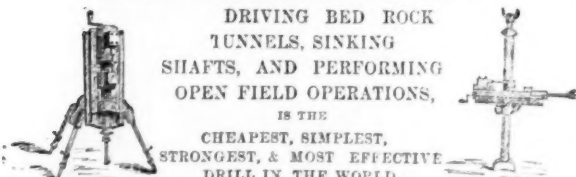
DRY HAIR FELT, for deadening sound and for covering steam pipes, thereby saving 25 per cent. in fuel by preventing the radiation of heat.

PATENT ASPHALTE ROOFING FELT, price 1d. per square foot.

Wholesale buyers and exporters allowed liberal discounts.

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DRIVING BED ROCK  
TUNNELS, SINKING  
SHAFTS, AND PERFORMING  
OPEN FIELD OPERATIONS,  
IS THE

CHEAPEST, SIMPLEST,  
STRONGEST, & MOST EFFECTIVE  
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By a special method of preparation, this leather is made solid, perfectly close in texture, and impermeable to water; it has, therefore, all the qualifications essential for pump buckets, and is the most durable material of which they can be made. It may be had of all dealers in leather, and of—

I. AND T. HEPBURN AND SONS,  
TANNERS AND CURRIERS, LEATHER MILLBAND AND ROPE PIPE  
MANUFACTURERS,  
LONG LANE, SOUTHWARK, LONDON  
Prize Medals, 1851, 1855, 1862, for  
MILL BANDS, ROPE, AND LEATHER FOR MACHINERY PURPOSES.

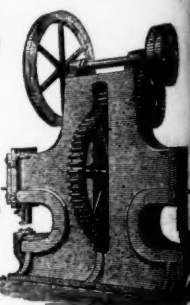
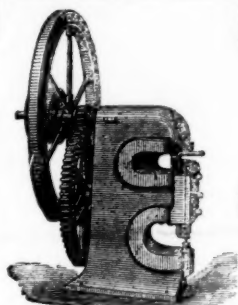
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Suitable for Collieries, Shipbuilders, Boiler Makers,  
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Self-acting, Slide, and Screw-cutting  
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Slotting Machines; Shaping Machines;  
Drilling, Planing, and Screwing  
Machines;

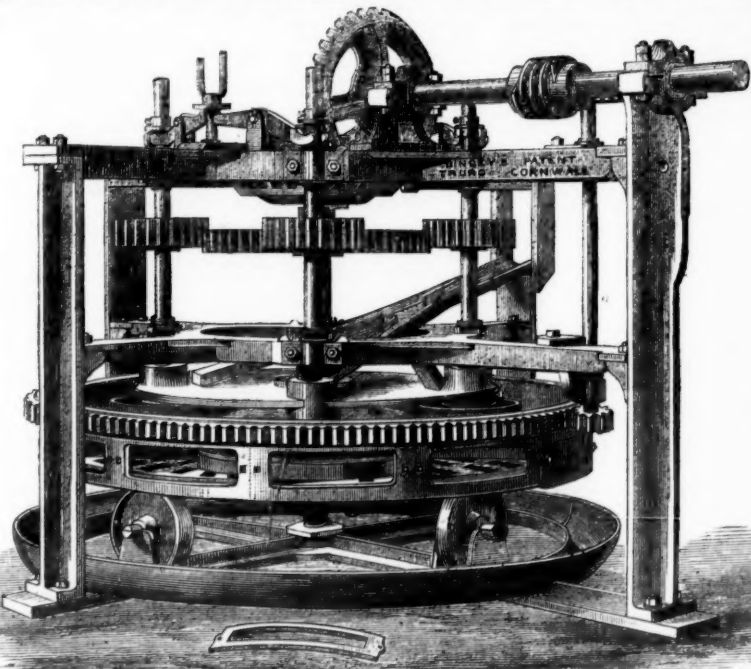
And Miscellaneous Tools of every kind always in Stock.



**J. GOODWORTH, KIRKSTALL ROAD, LEEDS.**

## DINGEY'S PATENT PULVERISER.

First Silver Medal, Royal Cornwall Polytechnic Society, awarded 1870.  
Special Premium of £20, offered conjointly by the Editor of "Mining Journal" and the Royal Cornwall Polytechnic Society for the Best Invention for Dressing Ores, awarded 1872.



This Machine is specially adapted for GRINDING TIN ROWS, LEAD SKIMPINGS, GOLD and SILVER ORES, &c. 1876.  
CLASS MINERAL ORES can be treated by this Machine that would not pay by any other treatment.  
This Pulveriser is working at Carn Brea, Tincroft, Wheal Jane, Frank Mills (Lead), and various other Mines.

### TESTIMONIALS.

From Capt. WM. TEAGUE, Jan. 31, 1876, Manager of Tincroft Mines, Redruth.  
I have used Dingley's Patent Pulverisers for some time, and am pleased to say they answer to my entire satisfaction; it is, therefore, with great pleasure I commend them to any party who may want machines for reducing sand almost to a pulp.

From Capt. JOHN NICHOLLS, Frank Mills (Lead) Mine, Christow, near Exeter, Jan. 4, 1876.  
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Address, for price, &c.—

**FRANCIS DINGEY & SON, Truro Foundry, Truro, Cornwall.**

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